The United States MILLER

Volume 8.—No. 6 MILWAUKEE, APRIL, 1880. Terms: $1.00 a Year in Advance. Single Copies, 10 Cents.

Directions for Setting Turbine Water Wheels.

BY MESSRS. STOUT, MILLS & TEMPLE, MANUFACTURERS OF THE CELEBRATED AMERICAN TURBINE, AT DAYTON, O.

They are placed in flumes or penstocks, consequently are entirely submerged, free from ice, and the water can be shut off at any time, and the wheels left dry for the removal of flood wood or foreign substances.

The first thing to be done in preparing to set wheels is to excavate wheel pits, (if there be none, or not of sufficient depth), put down mud-sills and sheet them over with two-inch plank (unless there be rock bottoms). These pits must be from two to four feet in depth, according to the size of the wheel. It should always be borne in mind that too free a discharge can not be made. On low heads, ten feet or less, the wheels should be set so the bottom will be in tail-water when they are standing. The deck-sills, or timbers on which the deck or floor of penstocks are placed, and on which the wheel-case will set, should be framed into corner posts, and be two inches wider than the posts, so as to leave a projection of two inches on the inside of penstocks for the deck-plant or floor to rest on. There should be corner pieces spiked in on the inside of deck-sills to assist in supporting the deck-plank. These form an octagon, and should be the same depth of sills, and three or four inches thick. Where penstocks are large (which is very desirable), there should be intermediate sills framed into main-sills, leaving a square of sufficient size to cut the holes through the deck-plank for wheels.

When the penstocks are completed there should not be less than from twenty-four to forty-eight inches of clear discharge from the lower side of these sills down to the sheeting in the bottom of wheel-pits, and the same depth should be continued the entire length of tail-race, otherwise there will be a loss of head.

On high heads (twelve feet and upwards) wheels may be set above tail-water, with draft tubes below wheels, extending into tail-water. Where this is done there should be the same depth of tail-water as if the wheels were set at the bottom of the fall. In constructing wood flumes for the purpose of setting wheels in this manner, the corner post only need extend down, which should be framed into sills placed lengthwise with tail race, so as not to obstruct the flow of water after being discharged.

The sills for deck plank or floor of flumes, on which the wheels rest, will be framed into corner post at the desired distance from tail-water, and the intermediate post framed into sills and caps in the usual manner. If the draft tubes are made of wood staves, the planks of which they are made must be sound, free from any imperfections, well seasoned, and not less than two and one-half inches thick. The utmost care should be taken in their construction, as they must be perfectly air-tight. Iron draft tubes are preferable to wood, as there is greater certainty of getting them perfect, and their cost does not greatly exceed that of wood tubes. If wooden tubes are used, the upper end will be spiked into circle cut into deck-plank, and be banded below deck with bands sufficiently close to make them air-tight. The lower end must extend into tail water not less than six inches when the water is shut off, and have the required depth of water from the lower end of tubes to bottom of wheel-pits (as above named). that there may be a free escape, and reaction from the bottom prevented.

The corner-post of penstocks must be rabbited two inches one way, and four the other, to receive the side-plank. This makes the strongest job, and prevents leakage. This will require corner-post twelve by fourteen inches, when the intermediate posts are ten inches.

When two or more wheels are to be used in the same mill, the penstock or flume can be made to receive all the wheels. This will require the intermediate sill to support the deck-plank.

We are aware that millwrights generally understand the nature of all we have here and elsewhere said in regard to the construction of flumes and setting our wheels, but for the information of the inexperienced, and for the benefit of owners of water powers, we have no doubt some general principles will be of great advantage. If these general principles are adhered to, they will prevent failures in the construction of flumes and wheel pits, and in setting turbine wheels.

We are induced to dwell upon this subject in consequence of its great importance, and also from the fact that many who are engaged in the construction of mills and the improvement of water powers have had but little opportunity of giving the subject that consideration which its importance demands. If such persons will follow these general proportions and arrangements in their operations, and have ordinary mechanical skill and judgment serious mistakes will be avoided.

We are also aware, from our experience, that these directions and proportions can not always be strictly carried out in all locations, or in old mills, which have been built without reference to putting in turbine wheels. In such instances judgment must be exercised, and the best possible arrangements made under the circumstances. Care must be taken not to deviate so far as to destroy the effective force of the water by an insufficient supply into the flumes, or contracted discharge from the wheels. The supply of water into the penstocks should be large, so that it will stand as quietly over the wheels as possible, as the effective force of water is diminished by flowing rapidly into penstocks. All that is essential to make them do good service is to have a place to hold the water, have a good supply of water into the penstocks and a free discharge below, and have the wheels set level on solid foundations.

The floor or deck of the penstock can be made of rough plank spiked down, and, after cutting the hole to receive the wheel-case, spike a cant made of plank two or three inches thick, on the face of the deck, of sufficient width to receive the flange of the case; after spiking this cant down, plane it level on the face, which will make the wheel level and the shaft plumb, as the bottom of the cases are turned true, and are at right angles to their shafts. When two or more wheels are sent to one place, each set will be numbered to distinguish them.

Wood penstocks or flumes, in which the water wheels are placed, should not be less than double the size square of the wheels' diameter; that is, for one 48-inch wheel, make the penstock eight feet square in the clear; and the same proportion for any other size wheel. But where several wheels are set in the same penstock, a less proportion will answer. Where only one small wheel is to be used, a larger proportionate penstock should be made, for the convenience of getting about the wheel.

In some instances where a square penstock can not be made of sufficient size, the space may be such that a circular flume can be built of staves, which answers quite as well. Where such is the case, place the deck-plank on timbers or masonary, and cut a groove in the face to insert the staves; band them with iron, place two timbers across the top, and put bolts through each end of these timbers, extending through the lower deck, and clamp the tub down. If the water is to be admitted by an ordinary open forebay, frame two posts at the tub formed by the staves, equal distance apart as the width of the forebay, pass the bands around the tub and the end through these posts with screws and nuts, and clamp firmly; or, the water can be admitted by a round cylinder. On the two timbers, already described, on top of the round penstock, other timbers can be securely placed, if desired, to carry the gearing. This makes a good penstock, and will cost less than if made square for single wheels, as but a small amount of timber is required.

Henry & Co.'s New Mill at Huntingdon, Penn.

The new flouring mill fronts on Penn street, and runs back to Canal avenue in that part of Huntingdon borough known as Portstown, and cost, on a fair estimate, about $20,000. The building is a brick structure, 45x60 feet, four stories high, with a basement and an attic. The boiler house, also built of brick, 14x38 feet. The foundation walls are four feet thick and taper both ways to the top, until they are two feet thick.

Entering, the boiler house contains two tubular boilers, fire boxes, stacks, etc. Also a donkey engine, which is quite a novelty. This little giant is to be used to force water into the boilers, but has sufficient power to force a stream of water over the building, and in case of fire would be a great advantage. Leaving the boiler house we enter the engine room, where we see an 80 horse-power Corliss engine, which can be increased to 125 horse-power if necessary. This beautiful piece of machinery was built by the Atlas Engine Company, of Indianapolis, Ind. The cleaning machinery, the main shaft and two large receiving hoppers for wheat, having a capacity of 1,500 bushels, are all in the basement. The hoppers have conveyors under them to carry the wheat to the elevator, which takes it up to the attic. There is another large conveyor which takes the wheat to a Eureka smutter No. 1; from the smutter it drops into a short elevator, which dumps it into a short conveyor and it is then carried to a brush machine. From this machine the wheat is conveyed to the third floor by an elevator. Here we also see five large wheels on the main shaft, each one driving a run of stone by a 10-inch belt, one-fourth twist. On the first, or grinding floor, we find the burrs resting on stoutly built hurst, eighteen inches higher than the main floor. These burrs are clothed with hoops made of Georgia pine. The hoppers are made of copper, and are quite a curiosity to those who have been accustomed to see the old-fashioned wooden hoppers. Before the wheat reaches these hoppers it passes through the celebrated C. T Hanna wheat heater, one of which is connected with each run of wheat stones. The choppers are supplied with one of J. H. Bradford's patent feed and mixing hoppers—a very good thing. Passing to the right we see a flour packer, which packs the flour as fast as you desire. Surrounding the packer are large chests to receive the "low grade," "straight grade," "fancy," "patent," and other grades of flour. Conveniently near and neatly placed in the floor, are a pair of flour scales, the very best manufactured. Resting on another pair is a 100-bushel hopper. Moving along we come to another chest, which will be used for bolted meal; beside it is still another pair of scales for weighing chop, feed, meal, etc.

The second floor contains two bins each capable of storing twenty to thirty tons of bran or chop. To the right of these is the stock hopper for the chop, the stock hopper for the wheat burrs and the middlings hopper. To the right of these is a large sink or reservoir for the flour, capable of holding 100 barrels, and a pair of chilled iron rolls to crush the germ and middlings. All the wheat brought to the mill by farmers is taken in on this floor and emptied into the hopper scales.

Ascending to the third floor we see a corn crusher, intended for the accommodation of farmer customers who use crushed corn for fattening cattle. On this floor the six reel bolt begins. There is also a second grade bolt and an automatic grain register. On this floor are also located granaries for storing corn, oats and rye.

On the fourth floor we find a continuance of the flour bolts, a bran scalper, two purifiers, a dust room which passes on through the attic, a corn bolt and machinery running almost noiselessly.

On ascending to the fifth floor the first object that invites our attention is a dustless separator. The machinery for hoisting, a distributing conveyer with spouts for carrying grain to any desired part of the mill, are also on this floor. All their wheat is housed in one massive granary, reaching from the attic to the first floor. It has five partitions, and is shut off from the gearing and machinery in the mill. This granary has a capacity of 20,000 bushels of wheat, and is arranged with an elevator and conveyer, so that the grain can be changed from one bin to another without any manual labor, except simply to change a spout and draw a slide. On each floor we notice a barrel filled with salt water, with a bucket alongside for convenience in case of fire. One of Babcock's fire extinguishers is also kept ready for services, and can be put in use in a very short time.

There are two openings in the outside walls of the mill, through which will be unloaded the grain received by the cars. A pivot-bridge will be swung across the canal, so that cars can be run to the mill and discharge their cargoes into these receptacles.

The capacity of the mill is one hundred barrels of flour and nine tons of chop per day. The burrs are all old stock French burrs. The choppers and wheat burrs are 48 inches in diameter, and the middlings burrs are 36 inches in diameter, all run by adjustable drivers. There are 1,029 feet of belting in the mill. The driving belt is 65 feet long and 21 inches wide. There are 14 elevators and 30 conveyers.—*Huntingdon Globe.*

LEIF ERICSSON'S WILD OATS.—Mr. Ernest Frolich, of Christiana, Norway, thinks he has found in our Indian rice a living proof of the truth of Snorre Sturlson's history of Leif Ericsson's visits to this country nearly nine hundred years ago. The voyagers reported finding in Vinland not only an abundance of wild grapes, but a kind of grain which they called wild oats, growing plentifully along the marshy river sides. This grain, which they said the natives used for food, can be no other he thinks than the well-known Indian rice, or wild rye (*Zizania*), which grows almost everywhere along the swampy borders of our coast streams as well as around inland lakes and ponds. Mr. Frolich proposes to follow the example of our Western game preserving associations, who are sowing wild rice in our marshes for the benefit of wild fowl, by sending home seed for planting on Norwegian marsh lands and moors.

EFFECTS OF PERFUME ON HEALTH.—An Italian professor has made some very agreeable medicinal researches, resulting in the discovery that vegetable perfumes exercise a positively healthful influence on the atmosphere, converting its oxygen into ozone, and thus increasing its oxidizing influence. The essences found to develop the largest quantity of ozone are those of cherry, laurel, clover, lavender, mint, juniper, lemon, fennel and bergamot; those that give it in smaller quantity are anise, nutmeg and thyme. The flowers of the narcissus, hyacinth, mignonette, heliotrope and lily of the valley develop ozone in closed vessels. Flowers destitute of perfume do not develop it, and those which have but slight perfume develop it in small quanties. Reasoning from these facts the professor recommends the cultivation of flowers in marshy districts, and in all places infested with animal emanations on account of powerful oxidizing influence of ozone.

UNITED STATES MILLER.

PUBLISHED MONTHLY.

OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.

Subscription Price.....$1 per year in advance
Foreign Subscription.....$1.50 per year in advance

ANNOUNCEMENT.

MR. P. SCHNEITLER, *Berlin, N. Mueller St., 179 B, is duly authorized to receive subscriptions and advertisements for the* UNITED STATES MILLER, *from all parts of Continental Europe, and to receive payment for the same.*

HENRY F. GILLIG & Co., 449 *Strand, London, England, are authorized to receive subscriptions and advertisements for the* UNITED STATES MILLER.

MILWAUKEE, APRIL, 1880.

MILLERS' ASSOCIATION DIRECTORY.

NATIONAL ASSOCIATION.

President—George Bain.....St. Louis, Mo. Secretary and Treas.—S. H. Seamans, Milwaukee, Wis. VICE PRESIDENTS—L. Fletcher, Minneapolis, Minn.; Robert Tyson, Baltimore, Md.

ACTING EXECUTIVE COMMITTEE—Geo. H. Christian, Minneapolis, Minn.; S. H. Seamans, Milwaukee, Wis.; Alex. H. Smith, St. Louis, Mo.; Philip Haxall, Richmond, Va.; J. A. Hines, Rochester, N. Y.

STATE ASSOCIATIONS.

MINNESOTA—President, W. P. Brown, Red Wing; Secretary, F. B. Mills, Minneapolis; Treasurer, J. A. Christian, Minneapolis.

IOWA—President, J. J. Snouffer, Cedar Rapids; Vice-President, H. Hammond; Secretary and Treasurer, J. R. Serrin; Executive Committee, J. R. Serrin, H. Hammond, G. F. Weist, F. J. Woodbury.

NEBRASKA—President, Elam Clark, Omaha; Secretary, C. D. Smith, Lincoln; Treasurer, E. J. Curson, Lincoln.

KANSAS—President, Robert Atkinson, Ottawa; Secretary and Treasurer, Frank H. Pope, Ottawa.

MISSOURI—President, E. Goddard, St. Louis; First Vice-President, John Crangle, St. Louis; Second Vice-President, J. O. Roberts, Clarksville; Secretary, D. B. Kirk, St. Louis; Treasurer, Geo. J. Plant, St. Louis.

KENTUCKY—President, Wm. N. Potts, Richmond; Vice-Presidents, Jno. E. Miles, Frankfort; Wm. Shaw, Paris; C. J. Grover, Mt. Sterling; L. H. Nottnagel, Lexington; Secretary, E. D. Hix, Payne's Depot; Treasurer, A. Weisenberger, Payne's Depot.

ILLINOIS—President, D. B. Sparks, Alton; Secretary and Treasurer, C. H. Seybt, Highland.

WISCONSIN—President, E. Sanderson, Milwaukee; Secretary and Treasurer, S. H. Seamans, Milwaukee.

MICHIGAN—President, J. D. Hays, Detroit; Secretary and Treasurer, W. Hibbard, Grand Rapids.

INDIANA—President, Nicholas Ellis, Evansville; Secretary, H. H. Emery, Indianapolis; Treasurer, D. A. Richardson, Indianapolis.

OHIO—President, F. Schumacher, Akron; Secretary and Treasurer, Robert Colton, Bellefontaine.

MARYLAND—President, Robert Tyson, Baltimore; Secretaries, J. Olney Norris and W. B. McAtee, Baltimore; Treasurer, W. H. Woodyear, Baltimore.

NEW YORK—President, Geo. Motley, Rochester; Secretary and Treasurer, J. A. Hines, Rochester.

TEXAS—President, John Kerr; Secretary, M. Gray, Dallas; Treasurer, P. S. Sheppard, Houston.

PENNSYLVANIA—President, Chas. D. Miner, Wilkesbarre; Secretary and Treasurer, A. Z. Schock, Selinsgrove.

THE MILWAUKEE PRACTICAL MILLERS' ASSOCIATION—President, Chas. Mueller; Vice-President, Levi Hicks; Recording Secretary, H. W. Sherwood; Financial Secretary, Louis Holtz; Treasurer, E DeHaus; Usher, Edward Hiemke.

THE NATIONAL ASSOCIATION OF BRITISH AND IRISH MILLERS—President, Mr. Alderman Hadley, City Flour Mills, London, England; Secretary, J. H. Chatterton, 69 Mark Lane, London, E. C., England.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

MILLERS' DIRECTORY FOR 1880.

All mill-furnishers, flour brokers or other parties desiring to reach the flour mill owners and millwrights of the United States and Canada, should have a copy of the above named work. It contains about 15,600 names with Post-office addresses, and in many cases (notably in Wisconsin and Minnesota) gives the number of runs of stone, sets of rollers, and kind of power used, or the capacity in barrels. A limited number of copies only have been printed. Upwards of fifty of the leading mill-furnishing houses and flour brokers in this country and several in Europe have already secured copies. Send in your orders at once. Price Ten Dollars, on receipt of which Directory will be forwarded post-paid by mail, registered. Address

UNITED STATES MILLER,
MILWAUKEE, WIS.

THE Richmond City Mill Works, of Richmond, Ind., have just favored us with a copy of their handsome new catalogue of flour milling machinery.

MESSRS. KOSMACK & HUELSEKOPF, of Glasgow, Scotland, a well-known firm of flour brokers, will have a representative in attendance at the Cincinnati Millers' Exhibition.

R. L. DOWNTON, of roller-mill fame, has visited Milwaukee a couple of times during the past month. He says he is crowded with orders for his new corrugated roller-mills.

J. B. A. KERN, owner of the Eagle Mills, Milwaukee, is just staking off the ground for an immense addition to his present mill, 80x105 feet and seven stories in height.

MESSRS. RUMSEY & CO,, of Seneca Falls, N. Y., have just issued their new catalogue of pumps, fire engines, etc. It is one of the most complete catalogues of pumps of allkinds ever published.

THE NAVIGATION ON THE BALTIC.—It is announced from Stettin and other ports on the Baltic that the winter is now over, and the navigation of that sea has been resumed for the season of 1880.

If you are not already a subscriber to the UNITED STATES MILLER, *send one dollar at once and begin with our May number, which commences the fifth volume.*

MR. WILHELM FRESENIUS, of Bockenheim, Germany, lately favored this office with a call. He is favorably impressed with American mills, but is astonished to see so many idle during the past few weeks.

THE grounds have been purchased in Milwaukee, by a prominent Minnesota miller, on which a large flouring mill will soon be erected. Further particulars will be given soon. Milwaukee is certainly destined to be the foremost milling centre of America.

HENRY SMITH of the firm of Smith Bros., the Milwaukee millwrights, will be the "*most elected*" man in the city for Alderman April 6. He has received the nomination for Alderman from all the various parties in his district. We hope he is not the only honest man in his district, but all seem to unite in the opinion that he is an H. M.

MESSRS. NOTBOHM BROS., manufacturers of the Lacroix Middlings Purifier, desire all millers to know that they are still turning out machines which give the best of satisfaction. They infringe nobody's patent rights. The Lacroix Purifier is so well known that no particulars need be here mentioned. Address, sor full particulars, Notbohm Bros., Milwaukee, Wis.

FOREIGN MILLING DIRECTORY.—A Directory giving the names with post-office addresses of the flour mills containing upwards of three runs of stone in the German and Austrian Empire, has just been published. It gives the number of run of stone and kind of power. It is published in Leipzig, Germany; price, $9. It can be had, if desired, by ordering of the UNITED STATES MILLER.

THE large new manufactory of James Leffel & Co., at Springfield, O, is now being illuminated by the Weston electric light. The demand for the well-known and reliable Leffel water wheel and the Bookwalter engine is such that the firm is now running night and day to fill orders for these goods. The electric light enables the workmen to carry on their labors at night with all the freedom and facility which characterises work in the day time.

THE British and Irish Millers' Association have undoubtedly made a blunder in passing a resolution refusing to admit the reporters of the British millers' journals to its meetings and publishing their own reports and circulating them only to members of their association. The publishers of *The Miller* and the *Corn Trade Journal* and *Millers' Gazette*, of London, deserve a better reward for their invaluable services in aiding to make the British Association what it is, for without the aid of the milling press a National Millers' Association never would have been successfully established. The same is true in this country. We are inclined to believe that at another meeting this obnoxious resolution will be laid on the table.

A HEAVY PENALTY.—A case has just been decided at Hamburg, in which one of the heaviest penalties on record was imposed on the accused. The latter, a miller named Wegner, was proved to have systematically defrauded the Customs for years by smuggling into the district wheat and rye, and evading the comparatively light duty to which that class of produce is subject. It was found that within the past few years he had contrived to escape paying the regular impost on at least 650,000 kil of grain, and upon the facts having been demonstrated by the Government prosecutor, Herr Wegner, was sentenced by the Court to pay a penalty of 379,960 marks, equal to £18,993 in English money—about $95,000—or go to prison for two years.

How May Patents be Obtained in Germany?

[Communication by Mr. Paul Schneitler, Millwright, Consulting Engineer and Patent Solicitor, Berlin, N. Mueller Street, 179 B, Germany.]

In order to obtain a patent in German two drawings, two descriptions, an application and a power of attorney are required.

A. DRAWINGS—FIRST DESIGN.

1. Paper: White, strong, perfectly smooth Bristol paper.

2. Dimensions: 21cm. x 33cm., or 42cm.; x33cm., or 63cm.x33cm.

3. Length: Always 33cm.

4. Margin: 2cm. wide; only a heavy-black line.

5. Heading: 3cm. inside of margin line.

6. Signature of the inventor, or for foreigners that of the attorney in the lower right hand corner inside of margin.

7. Color: Only deep black lines drawn with India ink, cross lines dotted; no bright colors.

8. Writing is inadmissable on the drawing, except the signatures and the designations, figs. 1, 2, etc., as well as the letters designating the parts.

SECOND DESIGN.

1. Paper: Linen cloth.

2: Dimensions and form: Similar to first design.

4. Color: Cross lines may be drawn in bright colors.

B. DESCRIPTIONS.

1. Paper; Smooth white writing paper.

2. Dimensions: 21cm.x33cm.

3. Form: At the left a margin 5cm. in width, plain German writing; deep black ink, but no copying ink. At the close of the description it must be briefly stated what the inventor claims to be his intellectual property.

C. APPLICATION.

1. Form: Concise, directed to the Imperial Patent Office in Berlin.

2. Paper: Same as under heading B.

3. Dimensions: Ditto.

4. Signature of inventor or attorney.

D. MODELS.

As a general thing models are not necessary, but always desirable. To obtain patents on all shooting weapons, models must be sent.

E. PAYMENTS.

At the time of application, 20 marks ($5).

When patent is granted, 30 marks ($7.50).

Annual tax for second year, 50 marks ($12.50).

Annual tax for third year, 100 marks ($25).

Annual tax for fourth year, 150 marks ($37.50), the tax increasing by fifty marks in each succeeding year.

F. GENERAL REMARKS.

Rolled or folded papers will not be accepted. The drawings and descriptions must be carried out in such a manner that every expert is capable of applying the invention practically. The application for patents must be presented before the invention has been published and described in German or foreign print (newspapers, prospectus, circulars), and among these publications the English and American patent specifications, as well as the *Official Gazette*, are specially included. Americans must consequently apply for patents at such an early date that their applications can be presented at the German Patent Office before the specification has been printed or published in the *Official Gazette*.

The invention must furthermore not be in public use previous to the application for the patent in Germany, so that the use of it by experts does thereby appear possible.

FORM OF POWER OF ATTORNEY.

I hereby grant ..... to the Civil Engineer and Patent Solicitor, Mr, Paul Schneitler, residing in Berlin, N. Mueller St., 179 B, full authority to apply for ..... and ..... heirs for a patent in ..... on ..... invention regarding improvements of steam engines, ..., to sign all applications for this purpose, to present them, or eventually to withdraw them, with full right of substitution, to obtain continuations and rehearings, to hand in additional omendments to the principal patent, and, in general, to do all that is necessary legally to obtain and maintain the patent applied for.

Residence and date. Signature.

[Any of our readers desiring further particulars on the subject can obtain them by applying to the office of the UNITED STATES MILLER, where drawings may be seen.]

MODELS.—Hereafter inventors will not be obliged to furnish the U. S. Patent Office with models when applying for letters patent except in cases where the nature of the invention cannot be fully understood from drawings by the examiners.

The Wheat Question.

The position of the wheat question at present is something similar to the following: Take your map of Europe and draw a line from Hamburg, Germany, to Venice, Italy. All that section of Western Europe must continue to buy at whatever the price may be, whether it is $1.25, $1.50, or $2 per bushel. The prices on March 11 were: At Berlin, cash, $1.50 per bushel; Hamburg, cash, $1.50 per bushel; Paris, cash, $1.73½; futures June, 55f—equal to $1.65 per bushel; cash wheat at Amsterdam, $1.54½; and to-day's dispatch from Liverpool of 11s 1d per 100 pounds equals (cash) $1.59⅝ per bushel of 60 pounds. Now, the great question is one of stock at the various ports of Western Europe. They are small at all of them, and the great want of potatoes and other vegetables compels them to eat bread.

Now, take the wants of the Mediterranean Sea, they will absorb all the possible shipments from Southern Russia. Marseilles alone imported last year 30,000,000 bushels, and only had in store on March 12, 2,000,000 bushels—one month's consumption without additional imports.

There is some wheat in store in the sea of Azov, but not sufficient to continue the demand during the next three months from Southern France and Italy, without saying anything about Spain and Portugal. They must continue to buy from some source in order to keep eating.

Now, take the Baltic section, with such prices at Berlin. May and June wheat was selling on March 10 at $1.48 per bushel; Hamburg, $1.48⅝, and June and July options in both cities at $1.47½, equal to our values. Now they cannot export wheat to Great Britain at any such values as these. And as long as Northern or Atlantic France, Holland and Belgium continue to prefer to buy wheat "off coast," so long will their values be maintained.

What is the present stock of wheat in sight in the world at large compared to the continual daily consumption between April 1 and Aug. 1 of 15,000,000 of inhabitants, with no potatoes or other vegetables to help out the supply (except a few beans from Egypt)? The daily consumption of this number of people at one-quarter of a pound per head of wheat, without estimating the reduction of it into flour, amounts to 625,000 bushels, and into flour, 781,500 bushels. In other words, it will require 781,500 bushels of wheat per day to feed this portion of Western Europe. This will require a total of 95,343,000 bushels until Aug. 1. But a man cannot subsist on a quarter-pound of flour per day without vegetables, and recollecting that our own population have need of some flour.

Now, the stocks in the United States, the quantity of wheat afloat for Great Britain and the Continent, the stocks in British cities, French cities and Dutch cities, up to the latest dates (March 11), are to nearly 48,000,000 bushels. Can we furnish an equal quantity besides our present stocks in store, in addition to the wants of our own population, between now and Aug. 1? Our own wants are fully equal to 40,000,000 bushels.

This is the question for the short side to answer. I am placing our consumption at or on a basis of 160,000,000 bushels per annum, or four bushels per head. The present consumption of Great Britain is on a basis of six bushels per head, caused by lack of potatoes, etc.

Now, the balance of the Australian, Chilian, Californian, and Oregon wheat shipped after March 15 will not arrive at European cities in time to meet this consumption.

I said that men could not subsist on a quarter-pound per head. The various countries may have an additional one-eighth pound per head, but my late readings do not certify to it. Taking all Europe as a whole, my readings are down to March 18, from London.

JOHN C. HARRIS.

CHICAGO, Ill., March 31, 1880.

AN article, "How Nutmegs Grow," is going the rounds of the press. Just come into Connecticut and watch the turning lathes as they pare down the bird's eye maple into shape, the self-counting and packing machine that puts up the wooden spice for foreign markets, and then you'll know all about "How Nutmegs Grow."—*New Haven Register.*

AN English miller was brought before the local magistrate for allowing a poor woman, who was short of money on New Year's Day, to hold a lottery in his house. All she possessed was a pig and a family Bible, and as she did not want to sell the pig, she raffled off her Bible for three pounds. The miller got off on the plea that several public lotteries had been allowed in the neighborhood at church fairs and for charitable purposes.

The Chicago Board of Trade.

THE ANNUAL REPORT FOR 1879—INTERESTING FACTS AND FIGURES.

Mr. Charles Randolph, Secretary of the Board of Trade, has completed his annual report for 1879, of which the following is an abstract:

The receipts of agricultural products have increased over those of 1878, and largely over those of any other year. The exports of domestic products have continued to increase. The receipts of flour were about ten per cent. larger than in 1878, and the city manufacture somewhat less.

The receipts of wheat aggregated 34,106,109 bushels, and the shipments 31,006,789 bushels. The receipts are the largest by over 4,000,000 bushels that have ever arrived in the city. Prices ranged somewhat higher than in 1878.

The receipts of corn exceeded those of 1878 by 64,339,321 bushels. Prices were steady during the first nine months, but after the middle of October they advanced considerably, touching at one time 49 cents per bushel.

The crop of oats was inferior in yield and less in acreage than in 1878, and the crop in this State was 8,000,000 bushels less.

Rye was about the same as in 1878, aggregating in the receipts 2,497,000 bushels. The market showed a steady advance. The trade in barley was only moderate.

Live Stock was inclined to be dull, but the receipts were 6,500,000 head more than last year. The prices for cattle were rather lower than in 1878. The canned-meat business grew rapidly. Nearly three-quarters of the hogs received within the past year were slaughtered by city packers; the remainder, mainly of the heavier grades, have been mostly shipped to Eastern markets.

The packing of cattle is now mainly confined to that marketed in tin cans. This business has grown to vast proportions, but it is to be regretted that accurate statistics in respect to it are not attainable. The reported shipments of this class of product reach over 650,000 cases, but it is doubtless true that a considerable amount is classed under the head of miscellaneous merchandise, especially as 442,980 cases are reported among the direct exports from the city to Europe. In the packing of pork, Chicago still retains its pre-eminence, the packing of the calendar year of 1879 having reached over 4,800,000 head.

The trade in seeds increased greatly, especially in flaxseed, of which the receipts aggregated over 2,000,000 bushels. Prices were higher.

The shipments of produce from Chicago to Europe on through bills of lading have increased over 27 per cent. as compared with 1878, reaching the large amount of 768,153 tons, consisting mainly of grain, flour, meal and provisions; the value of these commodities could not have been less than $45,000,000. This class of business has grown so quietly and so steadily that its magnitude is but little appreciated by even our own citizens, but when attention is called to the fact that it is sufficient to load a steamer of 2,500 tons capacity every business day in the year, its importance will the more readily be comprehended.

On transportation Mr. Randolph says:

If Congress will simply establish a commission, say of five competent men, who shall be recognized by the country as men of unimpeachable character and of eminent qualifications for the delicate and responsible duties of their position, and clothe such a commission with ample authority to supervise and control, by their approval or disapproval, all questions relating to this subject that involve the rates to be charged for transportation, the classification of the traffic, and the general manner in which the business shall be conducted, conferring upon it the fullest authority to enforce its decisions, subject only to appeal to the United States Courts, pending which those decisions shall be observed; giving it full power to require the production of books and papers, and to examine them, and any individual when deemed necessary, and requiring said commission to make report to Congress at each regular session as to the result of their operations, and what, if any, further legislation is necessary to enable it to more fully accomplish the object of controling the interstate transportation business so that it shall be conducted in all its details with honesty and fairness, it may safely refrain from further details at the present time.

The receipts of the Board from membership fees and other sources were $71,605.23; expenditures, $67,574.36; on hand, $4,030.87.

Other details of the business of the city is shown by the following:

Elevator capacity, bushels, 16,955,000; flour manufactured in the city, barrels, 285,904; tea imported, half chests, 134,442; coffee imported, bags, 104,364; distilled spirits manufactured, gallons, 10,952,799; number of vessels arrived, 11,859; tonnage, 3,887,095; vessels cleared, 12,014; tonnage, 3,870,300; marine collections, $31,267.79; vessels owned in Chicago, 364; tonnage, 67,988; members of the Board, 1,940. Cultivated acreage in Illinois, winter wheat, 2,137,063; spring wheat, 303,736; corn, 7,918,881; oats, 1,631,130; hogs packed, 4,960,956.

For the purpose of comparison the export trade of the whole United States for 1878 was stated to be $695,749,930; in 1879, $699,538,742.

Milling.

At best, milling can only be considered an art. To be called an exact science, or to be called a science at all, would imply that the process is governed by fixed principles and guarded by certain fixed rules. But this is not true of milling. There are certain invariable principles involved, and, to a limited extent, certain rules that are largely applicable to most modes of milling, but changing circumstances change the conditions and also change the results.

We remember some time since hearing an old miller relate the fact that in former years he, in company with another man, owned and operated a mill somewhere in Missouri, adjacent to St. Louis, and they had the good luck to make an excellent brand of flour—lively, strong and clear—which made for them a large and profitable trade; had no difficulty in disposing in the St. Louis market of every barrel they could make at remunerative prices. Just why they should make an especially good brand they did not know, except they had for that time a very well fitted up mill. But, undoubtedly others in the neighborhood were equally well fitted up, yet were unable to compete with them in quality; and this is often the case. It quite frequently occurs that one miller will beat his neighbor in making flour with no apparent reason for it; each is equally well prepared, and each uses the same kind of stock, and both are good millers, but results differ, and neither can tell the cause of it. But to go back to our Missouri millers first referred to. After having a season of prosperity they had the misfortune to lose their mill by fire. Having done so well in milling, they never hesitated a moment about rebuilding, but proceeded at once to build them a new mill, better, doubtless, than the first, expecting in the future to do even better than in the past, imagining they knew just how to do it; but in this, as they afterwards found out, they had promised beyond their ability to perform. Do what they would they were never again able to make a flour equal to the old brand, and so lost their trade, lost their profits and also their interest in milling; and at the time the incident was related in the presence of the writer, one of the parties, and the one who had told the story, had long since quit the business, and was then "mine host" of a clever little Missouri hotel.

This is or was an extreme case, but it fully illustrates the fact that there are at times certain favorable conditions at work in making flour of which the operators have no knowledge, and at other times unfavorable conditions which seemingly cannot be overcome by any known method.

But while holding that milling in all its phases is not susceptible to positive demonstration as an exact science, there are enough of plain, positive rules which, if they are studied and put into execution, will make every man who wants to become such a good and successful flour-maker, and it is for the purpose of inducing millers to study and learn that these remarks have been written.

It is well known that the burrs should be of good and well selected stock, and should be ke kept in good face and furrow, well balanced, and in every other respect in good running shape. There should be cloth sufficient and of the proper grades to thoroughly and clearly bolt the flour, and take care of all the ground material while making the needed separations of flour from middlings, the latter to be treated to a good purifying process, afterward reground and rebolted. All of the arrangements, in fact, should be thorough and complete and perfect as possible; then, if stock is well selected, well graded and cleaned, all flour-makers, if they cannot do the best, can at least do good work, and can make good flour. Millers should study well the known principles involved and methods in vogue, steering clear of the hidden and mysterious, and all will be good millers.—*Grain Cleaner.*

Frictional Electricity in Seperating Flour From Bran.

Mention has already been made in these columes of a novel devise for separating flour from bran by means of frictional electricity, the contrivance having quite recently been made by a young man of twenty years, a student in the senior class at Yale College, named Thomas R. Osborne. The discovery of this new application of frictional electricity came about in this way: A short time since the son of Superintendent Smith, of the Atlantic Flour Mills, New Haven, noticed, while watching the process of bolting flour, that the electricity prevading the belting used in conection with the purifying machines attracted the bran and caused it to cling to the belts in large quantities. Thus was suggested the machine that was patented last month under the name of the "Electric Middlings Purifier," and which, friends say, is an invention equal in importance to that of the cotton gin, and the first application of frictional electricity to any practical use. The New York *Sun* gives an account of one of the purifiers in operation at the Atlantic Mills. Among those present were President Porter, Profs. Lyman, Thatcher, Johnson, Dr. J. P. S. Foster, and Librarian Van Name, of Yale College; Prof. Blake, of Providence, R. I.; and Ex-Gov. English, the Hon. Henry B. Harrison, Eli Whitney Blake, Thomas R. Trowbridge, and Arthur Osburn, of the Board of Education of New Haven. When young Smith conceived the idea of an electric purifier, he went to his friend and classmate Osborne, and asked him to get a machine constructed embodying the frictional electricity idea. Working together, the young men brought forth the present invention.

In the bolting machines now in use the bran is separated from the flour by a powerful air blast, which blows off the lighter bran. Considerable steam power is needed, the work must be done in an enclosed chamber on account of the dust, and there is great waste, because the air current carries off with the bran the finer particles of flour. In the new invention, electricity is designed to take the place of the air blast. Just over the wire bolting cloth, which has a rapid reciprocal motion, are a number of hard rubber cylinders, slowly revolving. As they turn they rub against strips of sheepskin, which are made to press down upon them thus generating the electricity. As the middlings are sieved by the reciprocal motion, the lighter bran comes to the top of the moving middlings, and is attracted to the rollers. To these it clings, as do pieces of paper to a stick of sealing wax when it has been smartly rubbed, until a certain quantity is thus attracted, when it drops into receiving troughs, whence by a simple mechanical arrangement the bran is brushed out at the side of the purifier into receptacles. At the same time the bolted flour is pouring out of the other side of the machine, while the "tailings" drop out at the end opposite the hopper.

The persons who saw the new purifier in operation lately, agreed that it was a wonderful invention. Although shown unenclosed, in an ordinary machine room, there was neither dust nor waste. It was said that the purifier could be run by one man working at a crank. The electric power was in proportion to the speed of the roller. In the experimental purifier eight six-inch rollers were used. Mr. Smith is now in Minnesota, arranging to put one into one of the largest flour mills in that state, which will have eighteen eight-inch rollers. It is claimed that the new purifier can be manufactured at less cost than those in present use. Last year there was great damage caused in Minneapoils, Minn., by an explosion in flour mills while bolting middlings by the air blast process. It is claimed that there can be no explosion where the electric machine is used.

While exhibiting the electric purifier Mr. Osborne explains that it was separating winter wheat middlings, and said that they are the most difficult to purify. The young man's explanations of the manner of operating the new invention were very clear. His father is a member of the local educational board, and has been for many years clerk of the Superior Court. The Hon. Henry B, Harrison, a prominent lawyer, is the young inventor's uncle, and his grandfather, Mr. Blake, has invented a successful stone crusher, and is himself a nephew of the cotton gin inventor, Eli Whitney. Mr. Osborne is popular among his classmates' and since his invention has been styled "Yale's young Edison."

An Irish Wake.

When evening came the storm lulled, and left a gloomy chill in its stead. The coffin arrived so expeditiously that some said it must have been made beforehand. A few country people who had met it on its way followed it with loud wailings, in which they rehearsed the virtues of those whom they had lost, and their grief and desolation in having them no longer with them. Often a coffin is thus escorted from a neighboring village to the house of mourning. It is then placed out of sight, as the body is not laid in it until a few minutes before leaving his last earthly abode; turf was heaped upon the fire, candles lighted, and a jug of whisky, filling the room with its penetrating odor, gave evidence of preparation for the approaching wake.

The villagers loitered about the doorway gossiping until the arrival of a weird old woman, who knelt at the threshold, and said: "God bless all here! God rest the soul of the dead!" Then seating herself by the side of the body, she stretched out her lean and shriveled hands, and bust forth into the most piercing lamentations, in which she recounted all the virtues of the defunct and of her family; other withered creatures, who had been smoking and dozing by the chimney, now aroused themselves, and joined in a doleful chorus. The intervals between the arrival of the guests—which were signals for new outbursts—were filled by whisky-drinking, smoking, snuffing and gossip. If any one who had lost a friend desired to do so, they could embrace this opportunity of "crying" him. As the night advanced the scene became one of wild excitement; the old people grew confidential and communicative over their cups, and the younger members amused themselves with various games.

Upon the breast of the corpse, which lay on the table in the center of the room, was a plate heaped with tobacco, from which each new-comer filled a pipe presented him on entering, and after murmuring a brief prayer, took his place either among the old people by the fire, or the younger ones in the farther extremity of the room. On the arrival of the neighbors, two old women, who were "given up" to be, as I was informed, the best criers in the parish, broke into unearthy howlings, and these dismal echoes died away amid the gossip of the elder and the laughs and jokes of the younger portion of the assemblage. From an obscure corner I watched unobserved the strange scene, and saw how, after each round of whisky, the rigid lines that marked the faces of the old men and women broke into a myriad traits of subtle expression, and their gummy eyes glistened and sparkled with a new-found life, while the young people were soon in the midst of a kissing game. A circle was formed round a youth, who was called upon to choose the prettiest from the assembled maidens. On being summoned, she advanced, kissed her admirer, who retired, and in her turn chose a young man from the group, and so the game proceeded until all had been kissed—I hoped to their satisfaction. Should any decline to meet the demands exacted by the laws of the game, they were beaten with a knotted apron, amid great hilarity and contention, into compliance. When this was finished, the old people, who had been drying tobacco by the fire, and powdering it into snuff by rolling it between their fingers, and partook of it in large quantities to keep themselves awake, again begun the death-song with wild vehemence. When they had somewhat relieved their feelings in this manner, the whisky was once more handed round, and the young people resumed their games. The old men and women refilled their pipes with the tobacco which lay on the dead woman's breast, and, warming their thin blood by the cheerful fire, listened to some cummer's tale.

One of the young men on the other side of the room, clad in an old red petticoat, ragged shawl, and a ruffled cap, his face begrimmed with soot, and a short pipe stuck in his mouth, personating an old woman in the agonies of a fatal sickness, attracted my attention. A tall youth in a white flannel jacket and trousers, whose face was the picture of health and jollity, endeavored to appear as wise—he was perhaps in verity—as a doctor. He felt the pulse, and shook his head, and prescribed "potheen," which, amid vociferous applause, was partaken of by the whole assemblage. He who counterfeited the old woman dropped his head, and was soon stretched on the floor, in simultation of death. Mourners grouped about him, and two of the leading spirits sat on either side as criers, the whole assemblage giving themselves up to the fun of this mad travesty.

"Never in my life can I cry well on this side of the corpse," said one of the madcaps, rising, and with his heavy hob-nailed shoes walked on as well as over the counterfeited corpse.

"Nor I either," cried the other, who walked over the body with even less tenderness than his companion.

If the object of this mock solicitude objected to this rough treatment, he was beaten into submission by the knotted apron before mentioned,

In the dry recital these scenes lose, perhaps, a great deal of their mirth; but when I witnessed them I could not resist the hilarity which they provoked, until the little grandchild, who had been sleeping, amid all this uprour, in her mother's lap, creeping to the table on which her grahdma lay, lugged at the sheet, and crying, "Mahmore," recalled me to the awful presence of the dead.

This touching incident did not seem to affect the rest of the assemblage in the same manner, for the sobbing child was sent back to its corner, and the old women broke into another verse of their death cry, while the young people prepared for another game.—*J. L. Cloud, in Harper's Magazine for March.*

UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

PUBLISHED MONTHLY.

OFFICE, 62 GRAND OPERA HOUSE, MILWAUKEE, WIS.

SUBSCRIPTION PRICE.—PER YEAR, IN ADVANCE.

To American subscribers, postage prepaid...$1 00
To Canadian subscribers, postage prepaid... 1 00
To British subscribers, postage prepaid..... 6s sterling.
To French subscribers, postage prepaid..... 7f. 50 cent,
To Austrian subscribers, postage prepaid..... 3 Florins.
To German subscribers, postage prepaid..... 5 Marks.

All Drafts and Post-Office Money Orders must be made payable to E. Harrison Cawker.

Bills for advertising will be sent monthly unless otherwise agreed upon.

[Entered at the Post Office at Milwaukee, Wis., as second-class matter.]

MILWAUKEE, APRIL, 1880.

THE UNITED STATES MILLER has now commenced its eighth volume, and has become universally acknowledged to be one of the most valuable milling journals in America, both for the purpose of transmitting knowledge on milling and mechanical subjects and as an advertising medium for introducing and selling all kinds of modern milling machinery. It is our aim to meet the wants of our patrons, whether manufacturers or consumers. Our editorial course will be entirely independent, and we shall do our best to give our readers the benefit of the latest important news on subjects pertaining to the objects of this paper. Our circulation and advertising patronage cover all sections of the country We do not deal in machinery ourselves, and consequently have no "*axes to grind*." We cordially invite all those who have already patronized us to continue their patronage, and those who have not to try our columns. We append herewith our

ADVERTISING RATES FOR 1880.

	1 mo.	4 mos	3 mos.	6 mos.	1 year.
One inch card	$ 2 00	$ 4 00	$ 5 50	$10 00	$20 00
Two "	4 00	8 00	11 00	20 00	40 00
Four "	6 00	12 00	16 50	30 00	60 00
One-half col. (8 inches)..	10 00	20 00	30 00	60 00	100 00
One fourth page	20 00	40 00	60 00	120 00	200 00
One-half page	40 00	80 00	120 00	200 00	400 00
One page	100 00	150 00	200 00	400 00	800 00

Size of page, 12x18. Length of column, 16 inches. Width of column, 2⅛ inches; 4 columns to each page.

Business editorial matter per line, 30 cents. If over 50 lines, 25 cents.

Illustrations charged for in proportion to space occupied.

Advertising for Millers wishing situations, or millers wanting to engage employes, 50 cents.

MILL FOR SALE advertisements, $2 each insertion.

Subscription price to the UNITED STATES MILLER, $1 per year.

M'Lean's Millers' Text Book, which every miller should have. Price by mail, 60 cents, post paid.

Ropp's Easy Calculator, which every business man should have in his pocket or on his desk. Price by mail, post paid, FIFTY CENTS.

Our Job Printing Department is one of the finest in the State, and particular attention is paid to all kinds of commercial work, which we can do on the most reasonable terms. Parties desiring to publish catalogues, circulars, etc., should send for estimates.

Address all communications to the

UNITED STATES MILLER,
Milwaukee, Wis., U. S. A.

Subscribe for the U. S. MILLER; $1 per year.

MILLER & MCCARTHY, of Mt. Union, Pa., report business good in their specialties. See advertisement in another column.

If you are not already a subscriber to the UNITED STATES MILLER, *send one dollar at once and begin with our May number, which commences the fifth volume.*

THE Jonathan Mill's system of grinding seems to have pretty clearly demonstated the fact that it is not necessary to have millstones made as heavy and cumbersome as are now generally used.

H. C. DART, of New York, has patented a self-raising pancake flour, composed of about one part oat meal flour to four of other flour with a leavening powder. So even our pancakes are patented at last.

The fifth volume of the UNITED STATES MILLER *commences with our May number. Send in your subscription at once. One dollar a year postpaid to any part of the United States of Canada.*

IT is said that strips of cedar wood nailed in bolting chests or purifiers will keep bugs and worms away. Bunches of elderberry leaves and blossoms hung up about the mill are said to have the same effect.

We will send a copy of the MILLERS' TEXT BOOK, by J. M'LEAN, of Glasgow, Scotland, and the UNITED STATES MILLER, for one year, to any address in the United States or Canada, for $1.25. Price of Text Book alone, 60 cents. Send cash or stamps.

We respectfully request our readers when they write to persons or firms advertising in this paper, to mention that their advertisement was seen in the UNITED STATES MILLER. *You will thereby oblige not only this paper, but the advertisers.*

MILWAUKEE citizens are making a great effort to secure the erection of an exposition building here, similar to the one in Chicago and for similar purposes. A large amount has already been subscribed. Hon. E. P. Allis, well known to the milling fraternity offers to contribute an engine and machinery to the value of $10,000.

☞ THE UNITED STATES MILLER *has the largest circulation of any milling journal published in America, and was the first milling journal started in America entirely independent of connection of interest with some machine or mill furnishing establishment.*

AS OUR mill owners are beginning to appreciate the benefit of having well-built and conveniently arranged mills, more than ever before, the demand for millwrights of unquestioned abillty is on the increase. A poor millwright is very dear at any price.

READERS in need of steam engines will do well to open correspondence with Wm. A. Harris, of Providence, R. I., whose advertisement appears on another page. The Harris-Corliss engine will be in operation at the Miller Exhibition.

MILWAUKEE has been visited during the past month by a great many country millers for the purpose of buying grain to keep their mills running on. They frequently find they can buy to better advantage here than of the farmers of their own counties, many of whom have been looking for wheat to go up to the $1.75 notch.

OUR BOOK DEPARTMENT.—We have made arrangements with the publishers to furnish our readers, at the lowest cash price, all kinds of practical books for practical men. We refer our readers to a list of these books in another column, headed "*Our Book Department.*" Millers, mechanics, machinists, engineers, etc., will find books mentioned there which they should not fail to have.

WHITEWASH YOUR MILLS.—All flouring mills should be thoroughly white-washed with lime wash, well salted, not only as a matter of cleanliness but as a preventative against fire. Wood work well white-washed will resist considerable fire. The Washburn "A" mill, in Minneapolis, has recently been given two good coats of white-wash, using therefor 85 barrels of lime. The owner of the Eagle Mills in this city said that he felt certain that one occasion his mill was saved from burning by the white-wash on the wood work.

A NEW VOLUME.—With this number we close the eighth volume and fourth year of the existence of the UNITED STATES MILLER, the first number of which appeared May 1st. 1876. We take this occasion to thank the many who have favored us with their patronage by subscriptions, advertisements or contributions. We have always endeavored to serve the interests of the milling fraternity to the best of our abllity, and if in anything we have erred it was more an error of the head than of the heart. We shall continue to make improvements as occasion may demand, and believe that we shall be able to give our readers far and near general satisfaction.

Herr Paul Schneitler, of Berlin, Germany.

To the efforts of the above named gentleman and his recent partner, Herr Josef J. van den Wyngaert, the President of the German Millers' Association, is due, in a great measure, the practical interest taken by the German milling industry in the First International Millers' Exposition at Cincinnati. These gentlemen have taken a deep interest in our Exposition, and are organizing a party to come over. Mr. Schneitler speaks and writes English readily, and Americans desiring to obtain European patents have found his services of the greatest value. Mr. Schneitler promises to favor the UNITED STATES MILLER with letters regularly containing, in a condensed and valuable form, the latest news on the Continent. We do not doubt but our readers will appreciate his letters. Mr. Schneitler was the technical Director of affairs at the last German Millers' Exhibition, which was the most extensive and successful ever held. We think all inventors desiring to obtain Continental patents will do well to write to him for full particulars. His address is as follows: P. Schneitler, Berlin, N., Mueller-Strasse, 179 B., Germany.

A MINNEAPOLIS correspondent in a recent letter, says: The new Crown Roller mill is nearly completed, and unless some unlooked for impediment occur, it will be in running order by April 1st. Since the commencement of the work it has been pushed with much vigor, and it is the intention of the proprietors to fit up one-half of the mill and have it at work while the remainder is being furnished. An important feature in this mill is the structure and situation of the elevator. This elevator contains an invention of the proprietors in the shape of tubular bins seven and one-half feet in diameter and seventy feet in height, made of boiler iron. The mill and the elevator are entirely disconnected, and in case of fire, the stored wheat would be free from danger. A fire in the elevator could hardly do any damage as the bins rest on iron supporting-beams. The mill is a new and valuable acquisition to the milling business of the city, and when it, together with the new Washburn "A" and the Pillsbury "A," to be constructed this coming season, are completed and at work, will add materially to the flour production of Minneapolis.

THE ELECTRIC MIDDLINGS PURIFIER.—A public exhibition was given in New Haven, March 13, of the electric middlings purifier, the joint invention of two young men of that city. The working of the device is said to have been highly promising. Over the wire bolting cloths are placed a bank of hard rubber cylinders, which are slowly revolved against strips of sheep-skin and thus electrified. To these rollers the light bran is attracted, to be mechanically brushed into a proper receptacle. This substitution of electric attraction for the air blast in separating bran from flour is said to lessen the waste, while it obviates the necessity of doing the work in a closed chamber and the risk of explosions. The exhibition was made in an open reom, and there was neither dust nor waste.—*Scientific American.*

Recent Milling Patents.

The following patents were issued from the United States Patent Office Feb. 24th, 1880:

Machine for leveling millstones and tramming spindles.—David E. Baughey, St. Thomas, Pa.

Millstone driver.—A. B. Crowell & A. Talbot, Richmond, Va.

Millstone balancing device.—Luther Read, Henderson, N. Y.

Corn sheller separator.—Rufus H. Sheldon, Jr., Sterling, Ill.

Middlings purifier.—Wm. L. Teter, Philadelphia, Pa.

Millstone dressing hand tool.—Wm. L. Teter, Philadelphia, Pa.

PATENTS ISSUED MARCH 2, 1880.

Self-raising flour.—Henry C. Dart, New York, N. Y.

Grinding mill.—James Faulkner, assignor to J. Latshaw, Louisville, Ky.

Alarm attachment for grist mills.—William H. Hottel, Woodstock, Va.

Flour Packer.—Ambrose W. Straub, Philadelphia, Pa.

Magnetic grain separator.—J. B. Thayer and H. E. Cook, River Falls, Wis.

PATENTS ISSUED MARCH 9, 1880.

Grain decorticating and cleaning machine.—Ulysse Boucher, Paris France.

Middlings purifier.—Absalom R. Guilder, Minneapolis, Minn.

Grain and middlings grinding mill.—James Higginbottom and E. Hutchinson, Liverpool, England.

Millstone dressing machine.—E. H. Vulpius, assignor to S. E. Griscom, Pottsville, Pa.

PATENTS ISSUED MARCH 16, 1880.

Disintegrating mill.—Lewis J. Bennett, Buffalo, N. Y.

Feed mill.—Lloyd J. Caldwell, Bourbon, Ind.

Flour bolting apparatus.—Charles J. Shuttleworth, Springfield, and O. M. Morse, Silver Creek, N. Y.

PATENTS ISSUED MARCH 23, 1880.

Grain meter.—Charles H. Horton, Brighton, Ohio.

Middlings purifier.—Thos. D. Isbell, Ukiah, Cal.

Apparatus for purifying grain.—Oscar Oexle, Augsburg, Bavaria, Germany.

Grain crushing roll.—John Stevens, Neenah, Wis.

Judgment of Men.

Don't judge a man by the clothes he wears. God made one and the tailor the other.

Don't judge him by his family connections, for Cain belonged to a very good family.

Don't judge a man by his failure in life, for many a man fails because he is too honest to succeed.

Don't judge a man by his speech, for a parrot talks, and the tongue is but an instrument of sound.

Don't judge a man by the house he lives in, for the lizard and the rat often inhabit the grandest structures.

KANSAS NATIVE LIME.—Considerable beds of calcined lime, or of a singular substance closely resembling burned lime in its qualities, are found in Kansas. This "native lime," as it is called, is described by a correspondent of the *American Architect* as possessing a beautiful white color and a very fine-grained texture. It is soft, smooth, and readily made into a plastic condition by the admixture of a suitable quantity of sand and water. The mortar thus made has seemingly indentical qualities to the best mortar as made from superior limes. The native lime is a sort of whitish and pure white clay, lying disposed favorably in beds more or less horizontal. These beds are seen to be outcropping along the borders of certain streams and in the breaks of hills, and in such places the beds can be worked entirely above the water level. Experiments have exhibited the fact that Kansas lime mortar serves as good purposes as any other usual styles or kinds of mortar, and even better than some of the artificial mortars, especially for inside work. The tendency of this newly discovered pseudo lime, when made into mortar for walls and stonework or plastering, is to set and harden soon. Another remarkable quality then noticed is its turning immediately to an intense whiteness. The beds are very thick and easily dug, so that large quantities of the substance can be thrown up, and at once applied to use. These immense beds of pseudo lime occur in localities where railways in eastern Kansas can be readily utilized for shipping the material to all parts of the country.

WINTER FISHING ON CHAUTAUQUA LAKE.—The winter fishing on Chautauqua Lake is a good deal of a business. Being an in and lake it freezes over quicker than Lake Erie, and when the latter body is open Chautauqua Lake has ice enough to hold up an army of fishermen. There are now about twenty "coops," as they are called, out on the ice. A "coop" is a box about three feet square, with a hole in the bottom. A hole is cut in the ice and the box is placed over it, and it being perfectly dark in there he can see the bottom as plain as day if the water is clear. If it is not clear a newspaper is sunk to the bottom under the coop, and fish passing over it are easily seen. Through this hole in the ice a wooden fish properly weighted is sunk to the proper depth, and with a cord attached to it the bogus fish is made to fly around lively, and thereby attract other fish to its locality. The man in the coop keeping watch, seeing a fish in good position, lets drop his heavy spear, weighing from fifteen to twenty pounds, fastening him to the bottom. Some large fish are caught in that way. The Monday before New Years there were caught three pickerel, weighing respectively twenty-seven, thirty and forty-two pounds. It is quite a business when the pond is frozen over, and those who follow it make money.—*Silver Creek (N. Y.) Local.*

CEMENT.—In stopping holes in castings, or for covering scars, a cement may be made of equal parts of gum arabic, plaster of paris and iron filings, and if a little finely pulverized white glass be added to the mixture it will make it still harder. This mixture forms a very hard cement that will resist the action of fire and water. It should be kept in its dry state and mixed with a little water when wanted for use. A cement for making joints in water and steam pipe, or in any work where two pieces of metal are joined together and it is desirable to make a perfectly tight joint, may be used, made of iron filings or turnings mixed with sal-ammonia. The proportion of sal-ammonia is very small; only about a half pound is used to fifty pounds of filings. This cement is mixed when wanted for use, and is driven into the joint with a cold chisel or other tool.

AN EFFECTIVE GLUE.—A very effeetive glue mixture is said to be employed by Turkish artisans in the nice work of attaching diamonds and other jewels to their metal settings. In the production of this substance the method pursued is to dissolve five or six bits of gum-mastic, each of the size of a large pea, in as much spirits of wine as will suffice to render it liquid; in another vessel as much isinglass—previously softened in water—is dissolved in brandy as will make a two-ounce vial of strong glue, adding two small bits of gum ammoniac, this being rubbed until dissolved. The whole is then mixed with heat, and kept in a vial closely stopped; when it is to be used, the vial is set in boiling water. This cement resists moisture, and will indissolubly unite two surfaces of polished steal.

The Chemistry of Bread Making.

CANTOR LECTURES, BY PROF. GRAHAM, D. S., LONDON, ENGLAND.

[Lecture delivered Dec. 1, 1879.]

Another experiment, which is hardly necessary to show you, is that caustic potash or soda has no action, or very little, on cane sugar, whereas it rapidly converts the glucoses into colored products. The yeast organism has a powerful action on solution of dextrose. It converts dextrose very rapidly into carbonic acid gas and alcohol. The same action takes place with lævo-glucose; but if you take a mixture of dextro-glucose and lævo-glucose, such as is made from inverted sugar, then you would find that the yeast organism uses much more dextro-glucose per unit of time than it does of the lævo-glucose. After some time you would, perhaps, find no dextro-glucose left, but there would be still some lævo-glucose left, which would give a certain fullness on the palate when you were drinking the ales for which it is employed.

This leads me to give you a short description of the method employed for the making of this inverted sugar. I have a sample of it here, which has been made in that way. The cane sugar is dissolved in water, and a small quantity of sulphuric acid is added to it, about one per cent. It is then heated, and in the course of an hour, or an hour and a-half, the whole of the cane sugar has been converted into a mixture of equal parts of dextro and lævo-glucose. This is evaporated down, and is employed very largely in the manufacture of beer—not exclusively, the proportion, perhaps, being one-fourth, or, more usually, one-sixth, along with malt—and the chief reason why the brewers employ this inverted sugar is, that it contains no albuminous matters. Now, in certain samples of barley, especially in some seasons, such as the one we have unfortunately passed through, there is a large quantity of soluble albuminous matters formed on account of the bad maturation period, just when these soluble albuminoids should be converted into insoluble. Under these circumstances, either a material such as this dextro-glucose, or a material such as you see here, which is a mixture of dextro and lævo-glucose, is employed in order to give a certain stability to beer which it otherwise might not have.

I think I have gone through the more important properties by which we may recognize starch, dextrine, sucrose, maltose, dextro-glucose and lævo-glucose, and I have, therefore, done for the present with the description of the properties of these important carbo-hydrates.

I have been somewhat lengthy in my remarks on these carbo-hydrates, and I dare say there are some few here who are very well acquainted with the properties of those bodies, but of course, in lecturing to a public audience, one must consider the audience in general, not those who may happen to have studied chemistry for some considerable period, and are tolerably familiar with these things; but I am bound to deal with these matters in this way, because if we take a generel audience, we shall find that there are many who have not had the opportunity of studying chemistry sufficiently long—or perhaps not even at all—to have acquired a knowledge of these bodies. Manifestly, when we come to consider what goes on in the important process of panification, and in the more important one of fermentation, we shall only be groping in the dark, if we have not previously laid a solid foundation of knowledge connected with the important properties of these bodies that have to enter into the composition of the bread.

I now revert to the consideration of the phenomena that occur when certain albuminoid ferments act upon starch paste. I pointed out, at our last meeting, the valuable researches of Mr. O'Sullivan, the chemist for Messrs. Bass & Co., of Burton-on-Trent. It is some few years since he pointed out (not that he was the first, because it was Dubranfaut who first clearly recognized and named it) a new sugar, to which he gave the name maltose and, even before O'Sullivan, Musculus gave an explanation of the hydration products brought about by the action of albuminoids on starch paste.

Six or seven years ago, when I had the honor to address an audience here, I was aware of what had just been published, but it was too late to alter my tables and statements; nor was I prepared to adopt Mr. O'Sullivan's researches in their entirety, so that, even then, I spoke of glucose and dextrine as being the products of the action of albuminoid ferments upon starch and sugar. We now know, however, thanks to the researches of O'Sullivan, and to the latter works of Musculus and Gruber, and also to those of Brown and Heron, corroborated by other chemists, that under no circumstances does malt infusion ever produce either dextro-glucose or lævo-glucose, but only maltose and dextrine, and, consequently, maltose and dextrine are the products of the action of that important ferment on a solution of starch.

A solution of soluble atarch, at first, when examined by a saccharometer, indicates a right-handed rotation of the plane of polarized light of 216 deg., and the reducing power on Fehling's liquid is nothing. In the course of a few minutes they find that the mixture, when acted on by a solution of iodine, indicates a brown color. Of course so long as there is soluble starch, the reaction with iodine would have given a blue color, but after a few minutes at that temperature, the solution indicates a brown color, with a right-handed rotation of 209 deg., and 6.4 action on Fehling's solution. In the course of two or three minutes longer, there is still a brown reaction, indicating what has been termed by Gruber erythro-dextrine. After that, however, at the particular period, where the right-handed rotation is 195 deg., and the reduction of Fehling's solution 18.9 they find that there is no colored product, but they obtain an achromatic dextrine. I will not go through the whole of this table, but the ultimate action, when carried out for a considerable length of time, is that no dextrine is left, and that the whole has been converted into maltose sugar, having a right-handed rotation of 150 deg., and a reducing power on Fehling's solution of 61 per cent; that is to say, 100 parts by weight of maltose sugar only reduces Fehling's solution as much as 61 parts by weight of dextro-glucose or lævo-glucose.

Now, you may say to me, what is the practical meaning of all this? What does it matter whether three or four molecules of dextrine are formed, or whether there are a great many. We shall see. The practical result, I take it, is this. You must remember that that Brown and Heron, precisely like O'Sullivan, have acted on starch paste, which is the representative of the boiled potatoes of the bakers, with a very powerful hydratiug agent, and Heron indicates that, even though he uses so powerful a hydrating agent as a malt infusion, there are a series of dextrines formed, and that, practically, the amount of maltose that is formed at a low temperature with a hydrating agent of weak power, as the albuminoids of wheat, manifestly must give us bodies very rich in dextrine, and particularly poor in maltose sugar. Possibly some of you may have forgotten, what I have already mentioned, that the yeast organism converts maltose into carbonic acid and alcohol, but the yeast organism has a very slight action on dextrine. Dextrine is a very stable body. It is so stable, as regards the power of the yeast organism upon it, that the German brewer, for example, and even the English brewer who wishes to imitate him, does all he can to try and obtain, in his infusion before fermentation, as much dextrine as possible from the hydration products of the barley. Now the dextrine is of no use to the baker; on the contrary, the more dextrine the baker forms in the panification process, either by employing bad flour, as I shall have hereafter to point out, or a bad process of fermentation—the more dextrine he forms in a given unit of time—whether it be in 6 or 12 hours, the worse color his loaf will be, because when you put dextrine bodies in the presence of moisture into an oven, they are converted into highly colored products; and the object of the baker, therefore, must be to find out some method by which he will get as much maltose formed and as little dextrine as possible.

Then, I think, the next point I have learned, not merely from these researches of Heron and O'Sullivan, but from all previous studies is this—that yeast has a considerable action on flour paste, but that yeast has a stilt greater action on soluble starch. I shall have to refer to these matters again.

I pass now, then, to the consideration of the albuminoids. Their general composition is given in this table:

AVERAGE COMPOSITION OF ALBUMINOIDS.

Carbon	53.3
Hydrogen	7.1
Nitrogen	15.7
Oxygen	22.1
Sulphur	1.8
	100

Hypothetical formula, C 72 H1 1 2 N1 8 SO2 2.

If you consult various works on the subject, you will find some slight discrepancies from the numbers given here, but this will fairly indicate the general nature of the albuminoid bodies: Carbon, 53.2; hydrogen, 7.1; nitrogen, 15.7; oxygen, 22.1; sulphur, 1.8. Now, these are the analytical results given by the chemist Lieberkunn, and he converts the centesimal ratios of these elements, and gives us this hypothetical formula, C72 H1 1 2 N1 8 SO22. I say hypothetical, because if starch has hitherto been to difficult for us to elucidate clearly the exact composition of its molecule, I need hardly say that the albuminoids are even more difficult.

The albuminoids of wheat flour differ very much from those of the other starches. We have on the table, the composition of the various flours.

On looking at the annexed table you will see that of albuminoids 10.9 is given to old wheat, 13 to barley, 16 to oats, 8 to rye, 8.9 to maize, 7.2 to rice. Oats and barley are very rich in albuminoids, and probably most of you have considered that wheat is pre-eminently rich in protein bodies, as they were called by Mulder, and that the value of any given sample of wheat flour would depend entirely on the total quantity of albuminoids in the wheat. I think I shall be able to demonstrate to you that such analyses as are given in this table, where all the albuminoids are put together under one head are utterly useless, and give us no idea whatever as to the value of a given sample of flour for the purpose of making bread. If you take good wheat flour and knead it with water—you all know the experiment—you will gradually get rid of the starch, and the gluten will cohere in a sticky adhesive mass. Of course, if you wash it sufficiently long, you get rid of the whole of the starch, and what remains is called crude gluten. The crude gluten, when moistened with water, coheres—its particles join together with considerable force. Here is a sample, and you will notice the peculiar tenacity of the elastic tough mass. The value in bread making of this peculiar property is no doubt manifest to all of you. If you have a body of such an elastic nature, it will entangle the carbonic acid produced by the action of the yeast on the starch, and the carbonic acid, being entangled in this way, will raise the whole mass. An abundance of these albuminoids is, therefore, necessary to good bread making.

AVERAGE COMPOSITION OF CEREALS. (FLOUR.)

	Old Wheat.	Barley.	Oats.	Rye.	Maize.	Rice.
Water	11·1	12·0	14·2	14·3	11 5	10·8
Starch	62·3	52·7	56.1	54·9	54·8	78·8
Fat	1·2	2·6	4·6	2·9	4·7	0·1
Cellulose	8·3	11·5	1·0	6·4	14·9	0·2
Gum and Sugar.	3·8	4·2	5·7	11.3	2·9	1·6
Albuminoids	10 9	13·2	16·0	8·8	8·9	7·2
Ash	1·6	2·8	2·2	1·8	1·6	0·9
Loss, etc	0·8	1·0	0·2	0 5	0·7	0·4
	100·0	100·0	100·0	100·0	100·0	100·0

Crude gluten consists of four-fifths of fibrin, and one-fifth of an albuminoid body called glutin, spelt with an "i," in order to indicate the difference between that and the whole mass, which is called gluten. These are left in the kneading process, and such a paste as you have just seen consists of the fibrin and glutin. On the other hand, in kneading flour and water, there passes into the solution along with the starch, an albuminoid body, that has been called sometimes casein and sometimes legumin. Now, if we take this gluten, we shall find that, when it is freed from water, it has no taste, and in addition to having no taste it is translucent. The buscuit, buns or loaves, which you see before you, have been made with gluten of flour, and I would like you to examine them after the lecture. I am indebted to Mr. Bonthron, of Regent street, for the different samples I have on the table here. He prepares the flour in such a way, that he can separate all the starch on the one hand from the crude gluten on the other. In this bag on the table, there is the crude gluten containing very little starch. In this other bag there is pure starch, and in this third bag, the flour from which these two products are obtained.

This kind of bread is used for diabetic patients, when the object of the physician is to restrain as much as possible, the use of starch in the food. Formerly, this diabetic bread came from Vienna. There is one sample, a pleasant soft bread, not intended to last a very long time, I suppose about ten days or a fortnight, so that patient living in different parts of England can readily obtain this kind of bread; whereas, this the other sample, dry, glistening porous biscuit, will keep an indefinite length of time, doubtless for many years. I said just now that gluten was tasteless. I see Mr. Bonthron has also supplied me with some little cakes, something like ginger-bread. They are flavored a little with ginger, in order that for lunch one may not always be driven to eat this tasteless mass. Some of these are prepared with almonds, and others with various flavoring materials, so that the patients can have a little variety in their diet.

I ought to mention that one reason I have for bringing this before your notice is, that these particular kinds of glutinous bread are made at about one-fourth or one-sixth the price of what they were sold at when brought all the way from Vienna.

Crude gluten is, then, a dry, tasteless, translucent body, where free from water; and we have seen that the crude gluten may be conveniently divided into glutin and fibrin. Glutin is slightly soluble in cold water, and much more so in hot water. Glutin dissolves in spirits of wine. I say spirits of wine, because if you were to take this product of Mr. Bonthron's, and act upon it with absolute alcohol, it would fail to dissolve out the glutin; but if you use spirits of wine, it would dissolve out all the glutin in time. Having thoroughly digested this crude glutin in spirits of wine, we have nothing left but the fibrin, and this fibrin is manifestly, therefore, not soluble in alcohol. Although fibrin is insoluble in water and in alcohol, yet, if we were to take fibrin and mix it with water, and allow it to be acted on at the ordinary temperature for a little time, it would gradually undergo putrefactive decomposition, and ultimately produce offensive products, but long before that occurred, in undergoing putrefactive fermentation, the complex nature of the fibrin would be broken down, and some soluble albuminoids would be formed. This degrading action takes place when grain or flour has been damaged by water, and this kind of fermentation process occurs; and, instead of obtaining the powerful elastic gluten, we have a material that has very little tenacity.

The soluble albuminoid bodies are the legumin and albumen. I prefer to call it legumin rather than casein, because legumin is found mainly in the seeds of the *leguminosa*: beans, pease, tares, and such like seeds. It is soluble in water, and in alcohol; it is precipitated by acetic acid, but the aqueous solution of legumin is not precipated on boiling.

The next member that is soluble in water is the albumen. Albumen is precipitated by alcohol, and also upon boiling a solution containing it. You all know that occurs also with ordinary animal albumen—that a solution of albumen, when heated, coagulates, as occurs when you boil an egg for some little time. One of the most delicate reactions to distinguish a small quantity of albumen, whether vegetable or animal, in solution, is to add to it some ferrocyanide of potassium and acetic acid. While Mr. Lewis is performing that experiment, I will pass on to the consideration of the last of the albuminoids to which I wish to draw your attention.

In the husk of wheat, that which one separates under the name of bran, occurs another albuminoid body called cerealin. Now cerealin has a very marked action upon starch, in other words, it acts like the so-called diastase. It acts as malt infusion, and the object of its being there, gathered together mainly in the bran, is for the purpose of enabling the young germinating plumule to obtain a large supply of nutriment, not entirely from the starch, but to a great extent from the cellulose of the outward layers of the corn. The cerealin, like many of the albuminoids, is precipitated by alcohol and also by acids. Now, these soluble bodies, legumin, albumen and cerealin, one or more of them occur in all seeds, and the reason that they occur in seeds, is that they are thereby present, under the germinatiug process, precisely what all chemists use in the researches upon starch, a material that has the power to convert the starch and even the cellulose into soluble materials, because you will remember that starch and cellulose are insoluble in water, whereas, when converted into various sugar bodies, they dissolve, and can be absorbed by the cells of the young growing plant. Now, the amount of this is somewhat increased by the process of sprouting or germination. I have here an analysis of the albuminous substances found in barley and malt:

ALBUMINOUS SUBSTANCES.

	Barley.	Malt.
Glutin (soluble in alcohol)	0·28	0·34
Coagulable by heat	0·28	0.45
Non-coagulable	1·55	2·08
Insoluble albumin	7·59	6·23
	9·70	9·10

In case of barley it is 9·7, and in malt, 9·1, but there has been considerable reduction in the amount of the insoluble albuminous bod

ies. They were 7·5 in barley, but they are only 6·2 in case of malt, with, of course, a corresponding increase in the quantity of the soluble albuminoid bodies. Sprouting increases, first of all tne quantity of the soluble albuminoid bodies; but, while that is noticeable enough, it is by no means so remarkable as the peculiar change that has taken place. Ordinary soluble albuminoids, in a well germinated and well garnered barley or wheat corn, are not very active in their action upon starch, whereas, if sprouting has taken place at all, in other words, if the germinating process has taken place, then there is a very marked increase of action.

I find time is passing so rapidly, that I must defer some matters to our next meeting, and I will just draw your attention to the character of the albuminoid bodies in the other cereals. Passing to barley flour, the chief difference in barley flour, as compared with wheat, is not in the amount of the albuminoid bodies, but in their character. If you take barley flour and knead it with water, as one often does, with flour, you would, after washing for some time, find that there was a very small quantity of this crude gluten left, and that barley flour would be a very inappropriate material to form a good loaf with. Of course, I know that barley flour has been used for ages, but if any one present has been in the habit of eating barley bread they will know to what I refer—it is a heavy, sticky, doughy sort of mass. It is more like wheat treated by the boiling process than by the oven process.

Rye flour, very rich in the total quantity of albuminoids, is so deficient in crude gluten, that when you knead it with water there is practically nothing left, the whole of it passes away along with the starch; not that it is soluble, but it is not coherent, and therefore does not form that tough, elastic mass, which is so characteristic of wheat under the same conditions.

Precisely the same may be said of oat flour. I do not know whether any one present has ever seen oat flour fermented with yeast in the ordinary way; but it is a heavy mass, and practically the same may be said of maize. Now rye flour is very much used in the North of Europe for the purpose of making bread; and it is with rye flour chiefly that the leaven process is employed; and those who have traveled in the northern parts of Europe will remember perfectly well the dark kind of bread that rye, fermented with leaven, gives. To a great extent, the same remarks as to the want of cohering elastic gluten would apply to oats, or barley, or any other cereal than wheat. Wheat, then, is pre-eminently fitted for the purpose of making bread by the fermentation process, since it is so rich in this tough elastic gluten, which holds in the carbonic acid, and enables you to have a light aerated bread.

[Lecture delivered Dec. 8, 1879.]

As there are many millers present for the first time this evening, from different parts of the country, I think it is desirable to give a short resume of the latter part of the last lecture, where I was discussing the albuminoids of wheat, because it is needful for the miller to understand the respective characters of the different albuminoids of wheat as for the baker; indeed, as milling precedes baking, it is perhaps even more so.

At our last meeting then, I pointed out to you that the albuminoids of the cereals differed greatly in their character, and that wheat is remarkably rich in those forms of albuminoids which do not dissolve in water, and which agglutinate together, and that it was on this account that wheat flour is, of all flours, that which is pre-eminently fitted, on account of the viscid resisting nature of its glunten, to lend itself to the action of carbonic acid in raising and piling the loaf, whereas the other cereals are very inefficient in that respect. Mr. Lewis, at present, is taking some of that crude gluten, and is kneading it with a little water and he will presently show you the wonderful elastic power of this material. The action of the water on the particles of crude gluten is to cause them to cohere together, forming a tough, elastic mass. We saw from the analysis before us at our last meeting, that wheat differs not so much in the amount of the total albuminoid principles, but rather in the nature of those albuminoids.

The albuminoids in cereals may be very conveniently divided into two chief categories, those which are soluble in water and those which are, at least at first, not soluble. Those which are insoluble, consist of glutin and fibrin; glutin differs from fibrin, inasmuch as it is slightly soluble, in cold water—more so in hot water; but that which distinguishes it from fibrin is that it dissolves in spirits of wine, whereas the other material, fibrin, which constitutes 71 per cent of crude gluten, does not. There are yet other forms of albuminoids, but these are soluble in water. They consist of albumen, which, of course, is soluble in water. It is precipitated by strong alcohol and by boiling, and differs therefrom from the next member, legumin, which resemble albumen in every other respect, except that on boiling it is not precipitated. Lastly, there is a form of soluble albuminoid matter, contained more especially in the husk or skin of the berry of the wheat, which has been called cerealin. This is a very active diastasic ferment, and resembles to a great extent the peculiar diastasic ferment which is obtained from malting barley, and infusing the result of that malting.

These three varieties of soluble albuminoids are found, one or more of them, more or less in all seeds, and for this reason. You remember I pointed out to you the nature of the caryopsis of barley, and I compared that with the rich, thick, fleshy cotyledons of the bean and pea, and I said when you considered the bean and pea or the caryopsis of the barley and wheat, we have in either case a mass of matter stored up by the parent plant for the future nourishment of the young embryo lying at the bottom in both cases. Now, the functions played by these soluble albuminoids is to convert the insoluble cellulose matter, the woody fibre, and after that has been to a great extent used up, then to attack the starch, the amalaceous matter, in the grain or in the seed, and convert it into soluble nourishment tor the young growing embryo. The amount of soluble albuminoids we shall presently see, is well-matured and well-gardened grain, is not large, whereas, in ill-matured grain and still more, of course, in sprouted grain, the amount of these albuminoid ferments is considerable.

I shall call your attention now to a very interesting experiment, because we shall find that it has a considerable bearing upon the very ingenious process of fermentation that bakers have discovered for themselves. If we take yeast, which is a powerful and active ferment when added to dextro or lævo-glucose, or maltose sugar, and add it to the unbroken starch cells, we shall find that, even after an hour in the cold, there is comparatively little action; whereas if we add to that yeast, and that unbroken starch — ordinary starch before it is boiled, and while the cells are not burst—a small quantity of the cold water infusion of any of the cereals, we shall find that, inasmuch as that cold water infusion contains soluble albuminoids, these are acted upon by the yeast, and are converted from their complex molecular structure into bodies of less complexity in their structure. In other words, they are less colloidal or gummy; they are more mobile. That peculiar molecular disturbance having been brought about, among the soluble albuminoid bodies in the cold water infusion of any of the cereals, by the peculiar action of yeast, these degraded albuminoids having the power of passing through the lining of the starch cell, and in that way the hydration of the starch is brought about, so that maltose sugar and dextrine of the various kinds I have told you about are formed; whereas, if we do not make use of these soluble albuminoids obtained from a cold water infusion of one of the cereals, if we take starch itself unboiled, we shall find that yeast has, in the same time, comparatively little action. Now, that is a matter of considerable interest, and we shall find that the baker has acquired all that knowledge practically long ago. I am only pointing it out to you on account of its scientific interest. Mr. Lewis has, in one tube, some water unbroken starch cells and yeast; in the other, in addition to the yeast and starch, he has added a small quantity of cold aqueous infusion of flour. These two tubes have stood one hour, and on testing a filtered portion of each, you will find that, whereas the yeast and starch alone have no action, or but little, on Fehling's solution when boiled with it, that in the other case, where a little cold infusion of flour was added, the Fehling's solution will show considerable reduction, proving that sugars have formed by the intervention of the soluble albuminoids of flour. (The experiments showed a marked difference.) We may gather, then, from this that the yeast cell is itself unable to pierce the starch cell, and that the action brought about by the yeast is indirect; by first of all degrading the ferm of the soluble albuminoids, and then causing them to ooze through the sac or wall of the starch cell.

The tendency of all albuminoids, even those which are insoluble in water, and even that which is the most complex in its structure, namely, fibrin, is to degrade, to become less and less complex, and ultimately, of course, to become soluble in water. The degradation of molecular structure is communicated to the complex molecular structure of starch, so that the complexity of the starch undergoing the peculiar degrading action which goes on in the albuminoid molecule is itself converted into molecules less complex than starch, namely, into maltose and dextrine; in some cases there may be also the production of other sugars. We see, then, that the albuminoids are powerful degraders, or breakers down of the complexity of molecular structure. But that is not the only interesting point connected with nitrogen. Curiously enough, we speak of nitrogen as being inert, and, as being merely used as it were for the purpose of diluting the oxygen of the atmosphere, hence we are all very liable to look upon nitrogen as playing a comparatively unimportant role in the phenomena of nature; and yet, strangely enough, were it not for the action of nitrogen, or rather of the compounds of nitrogen, there would be no life whatever in this world; there could be no simple cell even built up without the action of this marvellous architect, the nitrogenous compound. Every cell structure, and of course every large aggregation of cell structures, such as an oak tree, or a man, containing many millions of cell structures, is all built up by the wonderful agency of nitrogen, or rather of its compounds. But while nitrogen is so important an agent, so marvellous a builder up, it is for very similar reasons equally powerful in breaking down. Whenever you have albuminoids present, if there be moisture sufficient, and if there be warmth sufficient, there you have the agent ready for degradation. And hence it follows that man has been obliged to use two chief methods for the purpose of preventing this wonderful degrading power possessed by albuminoids. One method man adopts is heat. By the simple action of heat, some albuminoids are rendered insoluble, and therefore, inert. You know that if you take ordinary white of egg and boil it, you will, to some extent, prevent the degradation of the albumen, and it will last or withstand putrefection longer than if you had not so boiled it. Heat, together with drying, is a still more powerful method of preventing the attack of these albuminoids. If you were to take perfectly pure cellulose, which exists so largely in woody structure—if it were absolutely free from all kinds of albuminoids—you would find even in moisture it would not decay; it would last for ages, I may say; but we also know perfectly well that ordinary wood decays rapidly, especially if there be moisture. Now, the plan adopted in order to overcome this tendency to decay, is either to heat the wood, so as to char a portion of it, as used to be done when wood was charred on the outside to convert it into charcoal. That plan, however, has been replaced to a great extent by the still more efficacious way of acting on the albuminoids so as to precipitate them. Tannic acid and creosote precipitate the albuminoids and that is why the leather maker uses the tannic acid in oak bark or Bombay cutch, and why railroad companies take care to creosote their sleepers. The creosote precipitates the albuminoid matters, and therefore those albuminoid matters are not able to degrade the cellulose matters of wood. So in the same way fish is cured; the Finnon haddock is preserved, for a certain time by the action of smoke; hams are also preserved for a certain time. Other methods have been employed, such as the use of salt, and you will find that the baker has made use of this agent to prevent, to some extent, the degrading action of the albuminoids. The Egyptians, in the preparation of their mummies, had recourse to the same system, partly by drying and partly by the employment of certain aromatic principles, so that we find that heat, especially dry heat, is one of the means by which we can prevent the degrading action of albuminoids. The other method consists in the employment of chemical reagents, such as corrosive sublimate, tannic acid, creosote, and other matters of that kind, which prevents their activity by the precipitation of albuminoids. We shall presently see more of this when I come to speak of the rationale and object of the kiln-drying of grain.

ANALYSIS OF WHEAT. (PELIGOT.)

	Flemish.	Province.	Odessa.	Herisson.	Poulard Roux.	Poulard Bleu.	Poulard Bleu—Dry Year.	Midi.	Polish.	Hungarian.	Egyptian.	Spanish.	Taganrog.
Water	14.6	14.6	15.2	13.2	13.9	14.4	13.2	13.6	13.2	14.5	13.5	15.2	14.8
Fat	1.0	1.3	1.5	1.2	1.0	1.0	1.2	1.1	1.5	1.1	1.1	1.8	1.9
Insoluble Albuminoids	8.2	8.1	12.7	10.0	8.7	13.8	16.7	14.4	19.8	11.8	19.1	8.9	12.2
Soluble Albuminoids	2.4	1.8	1.6	1.7	1.9	1.8	1.4	1.6	1.7	1.6	1.5	1.8	1.4
Dextrine	9.2	8.1	6.3	6.8	7.8	7.2	5.9	6.4	6.8	5.4	6.0	7.3	7.9
Starch	62.7	66.1	61.3	67.1	66.7	59.9	59.7	59.8	55.1	65.6	59.8	63.9	57.9
Cellulose	1.8	...	...	...	...	1.5	...	1.4	...	...	...	...	2.3
Saline Matter	...	...	1.4	...	...	1.9	1.9	1.7	1.9	....	...	1.4	1.6

We have seen the great diversity in character of the albuminoids found in the different cereals, and I wish to draw your attention this evening to the degrading influences which are brought about in the character of the albuminoids of wheat by climatic influences. I have here the result of some researches of the eminent chemist, Peligot, on different wheats, taken chiefly from his own country, but to some extent from countries outside France.

By looking at this table we shall learn some very useful facts. In the first place, if we take the analysis of Flemish wheat, we find the insoluble albuminoids are 8.3, the soluble 2.4; in the case of Odessa wheat there are 12.7 insoluble and 1.6 soluble; Poulard bleu, 8.7 insoluble and 1.9 soluble; in the case of another variety of Poulard wheat we have 13.8 insoluble and 1.8 soluble. He also gives the analyses of the same wheat, but the product of a very dry year, in which the soluble albuminoids are only 1.4. I wish to draw your attention particularly to two or three points in this analysis. First of all, by dividing the insoluble of the soluble, so as to convert the soluble into unity, we shall have the following ratio: In the case of the Flemish, the ratio of insoluble to soluble is 4½ to 1; Odessa, 9 to 1; Poulard, 8½ to 1; Mida, 10 to 1; Polish, 12½ to 1, a very large ratio; Hungarian, 8½ to 1; Egyptian, 14 to 1; Spanish, 6 to 1; and Taganrog, 10 to 1. We shall see afterwards the importance of this to the miller when he has to consider the best method of mixing his wheats, for the purpose of producing a high-class flour. A very interesting point about these analyses of Peligot is this. I have not had an apportunity of referring to the original paper, and therefore I do not know whether he himself pointed out this interesting relation or not, but if you compare the soluble albuminoids with the amount of what he calls dextrine — of course the methods of analysis 36 years ago were not quite so perfect as we have now at our disposal — but still, taking the dextrine, which is now called maltose, together with dextrine, and comparing it with the soluble albuminoids, you will find a very strange ratio appears, and which is very constant throughout. The ratio of soluble albuminoids to dextrine in the case of Flemish wheat is 1 to 4. Taking the Odessa, which is so very different in character to the Flemish, so large is the amount of insoluble albuminoids compared with that in Flemish, still we have also the ratio of soluble albuminoids to dextrine as 1 to 4. In the case of Poulard bleu, there also we have 1 to 4, and so you will find in all cases 1 to 4, until we come to the Hungarian, where the ratio is not quite 1 to 4, but 1 to 3½. This, probably, is due to some slight error in the analytical process, not to any real difference in the nature of the compounds formed. So it goes on again to the Egyptian and Spanish as 1 to 4, until we come to the Taganrog, and there it is 1 to 5½. Possibly, this is also due to some error of analysis. With this exception, in a long list, we have the ratio of soluble albuminoids to the dextrine always as 1 to 4, evidently indicating some definite combination of the albuminoid matter with the sugar bodies.

INFLUENCE OF SEASONS ON THE CHARACTER OF WHEAT CROPS. (LAWES AND GILBERT.)

HARVESTS.	PARTICULARS OF THE PRODUCE.				COMPOSITION OF GRAIN.			COMPOSITION OF STRAW.	
	Total Corn and Straw per acre in lbs.	Per cent. corn in Total Produce.	Per cent. Dressed Corn in Total Corn.	Weight per bu of dressed Corn in lbs.	Per cent. Dry (212 degrees F.)	Per cent. Ash in Dry.	Per cent. Nitrogen in Dry.	Per cent. Dry (212 Deg.)	Per cent. Ash in Dry.	Per cent. Nitrogen in Dry.
‡ 1845	5,545	33.1	90.1	56.7	80.8	1.91	2.25	.....	.....	.....
1846	4,114	43.1	93.2	63.1	84.3	1.96	2.15	.....	.....	.....
1847	5,291	36.4	93.6	62.0	.....	.....	2.30	.....	.....	.....
‡ 1848	4,517	36.7	89.0	58.5	80.3	2.02	2.39	82.6	7.14	0.82
1849	5,320	40.9	95.5	63.5	83.1	1.84	1.94	82.9	6.17	0.78
‡ 1850	5,496	33.6	94.3	60.9	84.4	1.99	2.15	84.7	5.88	0.87
‡ 1851	5,279	38.2	92.1	62.6	84.9	1.89	1.98	84.2	5.58	0.78
‡ 1852	4,289	31.6	92.1	56.7	83.2	2.00	2.38	83.2	6.32	0.73
‡ 1853	3,932	25.1	85.9	50.2	80.8	2.24	2.35	81.0	9.27	0.97
‡ 1854	6,903	35.8	95.6	61.4	84.9	1.93	2.14	83.2	9.80	0.69
Means	5,053	55.4	92.1	59.6	82.9	1.98	2.20	83.2	9.17	0.82

I wish to draw your attention now to some important results published a good many years ago by Messrs. Lawes and Gilbert. Doubtless, to some of you the names of Lawes and Gilbert are well known, but to those who are not so well acquainted with them, I may say that the agricultural interest of England lie under a great debt to the public spirit and enterprise of Mr. Lawes, who has for more than thirty years spent some £4,000, if, indeed, it is not nearer £5,000 a year, on an elaborate series of researches, not merely into the influence of seasons upon wheat, but into an immense number of matters connected with agricultural chemistry. He has been most ably assisted in the great national work by his scientific *collaborateur*, Dr. Gilbert.

On referring to this table, you will notice that I have marked certain years, 1846, 1849, and 1851 with a ‡. Those years were remarkable for the dryness of the summer, the great amount of heat, the long continued heat, and the favorable conditions, not merely in the maturing period, but also in the harvesting period. If we look to the figures there given us by Lawes and Gilbert, we shall find, firstly, that the total weight of produce per acre is very high; secondly, that there is a high ratio of dressed corn to the total weight of corn; and, thirdly, that there is a high relative weight of corn. It is put here in pounds per bushel, and those who are well acquainted with agricultural matters, will see, of course, that 63 pounds per bushel, or 62½ pounds, indicates considerable excellence. Now, while the harvest was a favorable one, and the crop was good, we find that the amount of ash in the grain of 1846, was 1.9; in 1849, 1.8; in 1851, 1.89; which are low numbers compared with what we shall find in the bad years. But that is not all, a high produce or a valuable crop, and a high state of maturation of the grain, in other words, considerable excellence in the wheat, are accompanied by a comparatively low ratio of nitrogen—in 1846, 2.15; in 1849, 1.94; and in 1851, 1.98.

Now let us take the other aspect of the question. The bad years are marked with —; 1845, was a bad year; 1848, the year of political troubles, was also a year of great trouble to the farmers; 1852 and 1853 were also bad years. Now, if you look at these years, you will see that whilst the total corn is low, the weight of dressed corn is also low. In one year it is only 56 pounds to the bushel, and in another case 50 pounds. But if we can consider the ash, we find it is comparatively high. Take the case of 1848, which is a comparatively bad year, it is 1.02; in 1852, 2.0; in 1853, 2.24; and so on. The nitrogen is very high as well as the ash—I should say the ratio of percentage of nitrogen was high, not the actual amount produced per acre, but there is a high ratio to the corn itself—in 1845, 5.25; in 1852, 2,38; in 1853, 2.35. Consequently, you see that a high ratio of nitrogen, so far from being coincident with a good character of wheat, is rather coincident with a bad character of wheat, and the same applies to the ash; a high ash is rather indicative of a low quality of grain.

The analyses, given by Dr. Gilbert, were made after drying the corn, so that there is no moisture given here for you to compare with Peligot's results, but if you look at Peligot's results, you will find about 14 per cent., or about one-seventh of the whole, to consist of water. If we deduct this one-seventh from the nitrogen column of Lawes and Gilbert, we shall then obtain, by simply multiplying what remains by 6.33, the amount of albuminoids, as in the instances given by Peligot. Now, in the years 1846, 1849 and 1851, when that correction is made, if we compare Lawes' and Gilbert's with Peligot's results, we find that, in those three years, 10.85 was the average amount of the total albuminoids, soluble and insoluble put together. We see in the years 1845, 1848, 1852, and 1853, the bad years, that the average total amount of the albuminoids, soluble and insoluble, amount to 12.7. Thus, therefore, we find that the wheats of the bad years have two per cent. more albuminoid matters than the wheats of the good years. In other words, wheats of bad elaboration have the greatest amount of nitrogen. That, at least, refers to our own country; and not only is the amount of nitrogen or albuminoids high in bad years, but there is one other very serious matter for the miller, namely that these albuminoids are not well elaborated. A considerable quantity of them are soluble, like cerealin and albumin, and are high in proportion to the insoluble variety that the miller or baker requires.

To be Continued.

Legal Matters.

DECISION IN THE DOWNTON CASE.

Full Text.—In the Circuit Court of the United States, for the Eastern District of Missouri, September Term, A. D., 1879.

Robert L. Downton, plaintiff, vs. Yæger Milling Co., defendant. Patent.

W. G. Rainey and George Harding, Esq., attorneys for plaintiff. G. M. Steward and F. W. Cotzhausen, Esq., attorneys for defendant.

Oral remarks of Treat, J., deciding cause.

I am prepared to announce my conclusion in the case of Downton vs. The Yæger Milling Company. This case was presented at great length last Spring, and it was announced to counsel at that time, that if the Court was compelled, as matters then stood, to decide the case it would have to decide it in a certain way, but it would be more satisfactory if on certain points it could be more fully presented. That has been done, and very ably. One of the points as to which the Court was troubled was whether, under the existing state of the art, this being a process patent, there was any novelty in it. Second, was the patent itself sufficiently specific in its terms to make it practicable, or in other words, patentable, in the form pursued. It is not proposed this morning to go through the milling literature with regard to these matters, as the various stages of all the matters involved were fully considered at the time of the hearing of the milling cases before Judges Dillon, Nelson and myself. We were then very fully instructed as to this new process, and also as to the state of the art when the new process arose; and the conclusions announced in that case are very familiar to the counsel in this case, and to the milling public generally by this time.

Now, the mills using this new process interject rolls at various stages in connection with grinding, and after purifying, regrinding the purified middlings. Counsel were asked whether they construed this particular patent as covering any use of rolls on purified middlings at any stage of the processive grinding, or whether, under their construction of the patent, it was a use of rolls, one or more, at a stage intermediate the first and second grindings. Counsel were understood to say that the interjection of such rolls at any one of these successive stages was within the terms of the patent. The importance of that if the testimony is understood, relates to the question of infringement.

There was a controversy at an early stage of this case, growing out of the transactions between Downton, Allis & Company, of Milwaukee, and this defendant Yæger. Judges Dillon and myself disagreed in opinion with regard to the effect of the paper transactions involved; but his ruling with regard to the matter, was necessarily the ruling in the case. He held that if there was an infringement of this patent, then the defendant must answer, except as to the two chilled iron rolls interposed between the first and second grindings according to the terms of the patent; because Allis & Co., who were to some extent assignees in this matter, made those rolls according to Downton's description, Downton himself superintending the whole matter, and putting them in the mill. The contention being on the part of Downton that he informed these parties who had bought these rolls, which came under a subsequent patent, that whilst he put them in, they must give him a royalty under his process patent, and hence any use of the rolls by those parties did not exonerate them from a royalty therefor. Judge Dillon and I concurred as to those two, since they were supposed to have been put there for some purpose, they were put there by the plaintiff, and under his very patent, and if it is said that they were put there merely to clog the machinery, and for nothing involving a purpose, such a proposition cannot be maintaied.

Now the Court is brought for the purposes of this case to the construction of this patent. It has been read and re-read very carefully. If there is anything in it that is patentable, and involves novelty, it is not the use of rolls at every stage of this process, for all the Minnesota mills had been using it before; and in Europe and Missouri the same thing had been practiced for a long series of years; but it was the interjection of rolls between the first and second grindings, whereby certain effects would be produced, that is, such use flattens the germ or embryonic part of the berry, and also the pellicle, by a crushing instead of a grinding process. It is very obvious to any one who has looked into this subject, that if the grinding process is continued whereby all the matter of the berry, including the germ, which seems to be the most obnoxious part of the whole, is mixed, then instead of getting a first quality of flour, you have flour that is somewhat inferior in its character; for this waxy germ in itself has no especial nutritive property, but damages the flour through various causes. Hence, if you can take that out in the first instance so that it shall not be ground into the body of the flour, it is certainly a most beneficial effect. To do it you must crush, not grind, for this little embryonic particle is so very minute that unless you flatten it it may under trituration, or grinding, pass into the middlings, and if you grind the middlings it will go into the body of the flour. So that the true construction, and the only construction that will uphold this patent, is the interjection of those rolls between the first and second grinding of the purified middlings; by that means the fluffy matter would be thrown off, leaving the tailings to be operated upon thereafter. Then comes the next question: If that be the true reading of the patent, did this defendant use anything but the two chilled iron rolls at that stage of the process? The evidence is very uncertain on that point.

Some say that under the Wegmann patent, porcelain rolls were used at various stages. But no matter as to that. This question is one to which the Court asked particular attention, namely, here is a statement that by the use of rolls in a particular stage of this process, certain beneficial results can be had: that is, a flattening of the germ so that it will not pass through the bolts.

Now, is that to be construed in this way; that any device that might at any time thereafter be had, whereby such a result may occur, is covered by this patent? It seems that anterior to this patent Mowbray and others had been using rolls, and in that very stage of the process, but the contention was that the particular rolls that they were using did not effect the end to the desired extent; and hence subsequent to this process patent it became necessary to have some rolls invented which would effect the end.

Now, it is an elemental proposition as to patents that they shall be so clear that by ordinary means they can be worked out by a person skilled in the art. It is clear that this patent could not be operated by any method until some person invented rolls, which, whilst they should not be corrugated, because that would be as bad as the millstone in triturating, but should be smooth and yet have sufficient grip and be of sufficient hardness; and that was not all, they must have the same diameter, and work with equal speed instead of differential speed. Neither of which was suggested in the patent.

To summarize: The claim of the patent is specific. "The herein-described process of manufacturing middlings flour by passing the middlings after their discharge from a purifier, through or between rolls, and subsequently bolting and grinding the same, for the purpose set forth." Those purposes, as the specification states, are mainly for flattening the germ. That object was effected by the interposition of rolls at that particular stage of the process. Rolls of other stages of the milling process had been previously used; and even by Mowbray at that particular stage; hence, if the patent is to be construed by its terms as covering the use af rolls at any stage of the milling process, it had been long anticipated prior thereto. If it is to be restricted to the use of rolls at the particular stage mentioned, then so far as this case is concerned the plaintiff is estopped, because he himself, as heretofore decided, placed the only rolls used at that stage in the defendant's mill.

On the other hand, irrespective of the question of estoppel, if the patent is for a process to be effected without any known means of accomplishing the result, but requiring inventive faculty whereby rolls to accomplish the purposes and their modes of operation were to be determined by new inventions or discoveries, then the patent does not furnish to any one, as then skilled in the art, means whereby the beneficial end could be accomplished. No one in the then existing state of the art could by the use of any rolls known, or by any modes of operating the same, have effected the designed end. Consequently to uphold this patent for a process which would have been ineffective without some inventions thereafter had, would be to block the path to all future progress in the art of milling.

The necessary result is that I dismiss the bill; the patent being void for want of novelty, and uncertainty.

The Consolidated Middlings Purifier Co., of Washington, D. C., have filed a bill against Andrew Hunter, of Chicago, Ill., for infringement of their patents on middlings purifiers.

At the last term of the Court in the Northern District of New York, in the case of the Consolidated Middlings Purifier Co. vs. Griffin, for the infringement of the Smith patents, a decree was rendered affirming the validity of the patents, the title of the complainants and for the recovery of profits and damages to be ascertained by Wm. Townsend, who was appointed receiver, and a perpetual injunction granted.

The complainants in the case of the Consolidated Middlings Purifer Co. vs. Griffin, for infringement of the Cochrane patents, at the last term of the Court at Utica, N. Y., gave notice to have the case set for a hearing at the June term of the Court to be held by Judge Blatchford at Canandaguia, where it is probable that the whole Cochrane case will come up again in detail.

A Steam Road-Wagon.

During the Winter months Professor Saroni has been busy perfecting his steam wagon, and he will this week forward his model of the machinery to washington, D. C., for the purpose of securing letters patent upon it, he having so far been operating under a simple caveat. Since the appearance of the apparatus upon the streets last Fall it has been vastly improved. By a double system of clutches and pulleys, one at each end of the driving shaft, the power can be applied for speed or for slow work with heavy draught. But the greatest novelty that has been introduced into the machinery is a system of propulsion for use in case of ascending a steep hill. Taking the idea from the fact that a horse can draw a much heavier load than its own weight, the inventor has introduced two sets of levers that correspond exactly in movement and in the application of power with the two hind legs of a horse the one alternating with the other, precisely as do the limbs of the animal. It is difficult, without diagrams, to illustrate how this is accomplished, but its effect can be understood with sufficient clearness from the foregoing comparison. The second important advance made is in a device for the rapid generation in steam, which is a marvel of ingenuity, as well as a marvel of success.

As formerly, gasolene is the fuel employed, and is made to play upon pumice-stone, which heats to a whiteness, and thus not only creates a reservoir of constant heat, but should the flame be temporarily extinguished by a sudden jerk of the machinery, as it is apt to be, it is instantly rekindled. The pumice-stone occupies the fire-box, above which are arranged coils of pipe containing the water, which are so arranged as to give the water both lateral and longitudinal motion, and to permit the sediment to settle in the lower pipes on the side of the fire-box, where it can be readily taken out. A second and smaller boiler is used to generate steam first, and this superheated steam is conducted to a nozzle, at the end of which and below it is placed closely a second nozzle. This portion of the

apparatus is similar to the atomizers which are so familiarly known and used in procuring fine spray from bottles of perfume, and the action of the steam atomizer invented by Professor Saroni is precisely similar to that of a perfume bottle. The jet of superheated steam, as it emerges from its nozzle, meets a jet of gasoline vapor from the nozzle immediately below the steam nozzle, and steam and gas are together projected into the fire-box in that infinitely divided condition so favorable to chemical combination, resulting in intense combustion and the rapid production of heat. As soon as the pumice-stone has thus been sufficiently heated, the atomizers are shut off and the ordinary service jets are turned on. By this means steam can be generated from cold water to a pressure of 100 pounds in four minutes. It may be added that the "leg propulsion," if it may be so termed, can be used with or without the slow-motion pulley, or the locomotive apparatus may be entirely uncoupled, and the power applied to driving a thrashing-machine, with the wagon remaining stationary.—*St. Paul Pioneer-Press.*

Rules Governing Competitive Display of Flour at the Millers' Industrial Exposition.

SPECIAL PREMIUMS, CLASS NO. V.

Best barrel patent flour from spring wheat, gold medal.

Best barrel patent flour from winter wheat, gold medal.

Second best barrel patent flour from spring wheat, silver medal.

Second best barrel patent flour from winter wheat, silver medal.

Third best barrel patent flour from spring wheat, diploma.

Third best barrel patent flour from winter wheat, diploma.

Best barrel straight flour from spring wheat, gold medal.

Best barrel straight flour from winter wheat, gold medal.

Second best barrel straight flour from spring wheat, silver medal.

Second best barrel straight flour from winter wheat, silver medal.

Third best barrel straight flour from spring wheat, diploma.

Third best barrel straight flour from winter wheat, diploma.

RULES TO GOVERN COMPETITION IN CLASS NO. V.

1. The Millers' National Association shall appoint at least five judges to make the awards and no appeal from their decision will be allowed.

2. No entry will be received of less than one barrel.

3. No premium will be given for flour bleached by an artificial process.

4. No flour over four months old will be granted an award.

5. All flour entered for competition to become the property of the Exposition.

6. No entry fee will be charged for flour entered for competition, but all flour entered for exhibition shall pay an entry fee of five dollars.

Tests will be made chemically, and by baking, at the discretion of the judges.

The Committee have arranged a plan by which it will be impossible for the judges to know the manufacturer of the flour they are testing, or to whom the premiums have been awarded, until the records, to be deposited in a bank vault have been examined.

Rule 16, Rules and Regulations, has been changed to read as fellows: All exhibits of flour, grain and their products, entered for competition will be sold at auction at the close of the Exposition to the highest bidder, for the benefit of the Exposition fund, except such as may be manufactured in the building.

WHAT A SINGLE CENT DID.—A singular financial transaction occured in an office a day or two since. By some means or other it happened that the office boy owed one of the clerks three cents, the clerk owed the cashier two cents, and the cashier owed the office boy two cents. One day last week, the office boy having a cent in his pocket, concluded to diminish his debt, and therefor handed it over to the clerk, who in turn, paid half of his debt by giving it to the cashier. The latter handed it back to the boy saying that he only owed him one cent. The office boy again passed the the cent to the clerk, who passed it to the cashier, who passed it back to the boy, and the boy discharged his entire debt by handing it to the clerk, thereby squaring all accounts. Thus it may be seen how great is the benefit to be derived from a single cent if only expended judiciously.

Screenings.

A man went down on Wall street yesterday, and by a rise in the market cleared $1,000. This morning he tried the same racket, and in just half an hour he didn't have money enough to take him across the ferry.—*New York Express.*

"Leap year gives the young ladies a gentleman's privileges in making love." Perhaps it does. But no respectable young man, says an able Western journal, will have anything to do with a young lady who takes a position on the street corner and winks at the gentlemen as they pass by. Nor would it look well for a dozen or more young ladies to loaf around in front of a church an hour and a half on Sunday nights, sparring and knocking one another's hats off, and dancing a tra-la-la on the sidewalk in order to kill time until tne congregation is dismissed, and then buckle up to a young man and escort him home. Not any.

"An Englishman" writes to the Boston *Transcript* that he has learned some marvelous things about his native land during the few weeks he has been in America. Any American who has ever resided in England, even for a few days, knows just how he feels.

Human nature is queerly constituted. The average man doesn't feel as bad when he receives $10 too much change as he does when he gets 10 cents too little. He is more anxious to correct the little mistake than he is to rectify the big one.

Baltimore has a man named Mudd, and everybody he meets tells him to dry up.—*Philadelphia Press.* But he has one advantage over other men—nobody will ever care to sit down on him.—*New York Mail.*

The story is told at Williamsport, Pa., of a young man who went to the Black Hills to seek his fortune, and wrote back to his father that he had done well, but added: "I will be home on Wednesday evening. Meet me at dark, just out of town, and bring a blanket or a whole pair of trousers with you. I have a hat."

Experience teaches many things — prominent among which, to a man, is that is safer to run your chances with a balky mule than dictate to a woman on wash day.

"Do animals resist temptation?" asks *Popular Science*, and the editor theorizes on the subject for three hours, instead of going out and making a practical experiment by shaking a red flag at a goat.—*Boston Post.*

"Will you name the bones of the head?" said a teacher to one of his class. "I've got 'em all in my head, teacher," replied the pupil, "but I can't give 'em."

Some of the high-toned would-be-fashionable people of Fifth avenue, New York, are giving receptions at which only French is spoken. Something still more remarkable would be a swell party at which only good English was spoken.—*New Orleans Picayune.*

A Rhode Island man who left a son and daughter penniless that he might give Harvard College $50,000, had his will "busted" so quick that it almost turned his grave around.—*Detroit Free Press.*

A San Francisco paper announces the destruction by fire of a Chinese wash-house and its contents, "including a full and fine set of washing material and apparatus, and ten Chinamen."

A little girl who wrote an assay on the cow managed to state before closing that the "cow is the most useful animal in the world except religion."—*Rochester Express.*

This is getting to be a well-padded world. There are horse-pads, foot-pads, hip-pads, liver-pads, kidney-pads, lung-pads, and stomach-pads, and some one will soon have a pad for bald heads.—*Detroit Free Press.*

A poet asks: "Who shall go first to the shadowy land, my love or I?" If they contemplate committing suicide, to which no objections should be offered, we suggest they toss up a cent; heads, he goes first; tails, she goes last.—*Norristown Herald.*

A TON of gold or silver contains 29,166.66 ounces. A ton of gold is worth $602,875. A ton of silver, at the present rate per ounce, is worth about $32,000. A cubic foot of gold weighs 1,200 pounds, and is worth nearly $300,000. A cubic foot of silver weighs 600 pounds, and is worth about $10,000. The value of gold coin, bars, and bullion in circulation in the world is estimated at $3,500,000,000. This would make in one mass a twenty-five foot cube. The amount of silver in circulation in the world is believed to be equal in value to the gold supply.

Our Book Department.

For the convenience of our readers, we have made arrangements with publishess so that we can furnish any of the following works, postpaid, on receipt of price. All remittances must be made by post-office money order, draft on New York or Chicago, or by registered letter. For sums of less than $1 postage stamps will be taken. Address all orders to

E. HARRISON CAWKER,
Publisher United States Miller,
Milwaukee, Wis.

CRAIK—*The Practical American Millwright and Miller.* By DAVID CRAIK, Millwright. Illustrated by numerous wood engravings. and two folding plates. 8vo, $5.

CONTENTS.—Part I. Introduction—Chapter I. Mechanical Powers, The Lever, The Inclined Plane, The Wedge, The Screw, The Pulley and Cord, The Crank. II. Fly and Balance Wheels. Centrifugal Force and Circular Motion, Action and Reaction, Friction. III. Transmission and Transportation of Motive Power. IV. Peculiarities and Properties of Pressure of Water, Taking Levels, Fitting Down Sills Under Water, Pressure of Water, Velocity of Falling Water, Tables of Velocity of Water and Quantity Discharged, Measuring a Stream of Water, Table of the Quantity of Water Passing Over a Wier. Part II. Water Wheels. V. The Undershot. VI. The Overshot. VII. Experiments with Wheels, Barker's Wheel. VIII. Central Discharge Wheels. IX. Spiral Discharge Wheels, The Rose Wheel. X. Spiral or Screw Flood Wheels. XI. Mill-Dams. Part III.—Saw Mills. XII. The English Gate. XIII. The Mulley Saw. XIV. The Gang. XV. The Circular Saw-Mill, The Edging Circular, Table of Logs Reduced to Inch-board Measure. Part IV. Grist Mills. XVI. Planning, Gearing, Belt Gearing, Gearing Overshots, The Building, The Husk Timbers, etc., The Bridge Trees, The Step, The Spindle, The Bed-Stone, The Driver, The Damsil, The Boxes, The Bushes, The Curb, The Hopper, Shoes, Mill Stones, Burr Stones, Truing the Stones, Draught, Dressing the Stones, The Quarter Dress, The Sickle Dress, Balancing the Runner. Bolts, Bolt Chests, Bolt Cloth, Smut Machines, Screens. Merchant or Manufacturing Bolts. Part V.—XVII. The Oatmeal Mill, The Kiln, The Process of Drying, Dressing, and Hanging the Stones, Manufacture of Split Peas. XVIII. The Barley Mill. XIX. Wool Carding and Cloth Fulling and Dressing, The Tenter Bars, The Shearing Machine, The Cloth Press. XX. Windmills. XXI. Steam Power. Index.

HUGHES.—*American Miller and Millwright's Assistant.* By WM. CARTER HUGHES. A new edition. In one volume, 12mo. $1.50.

Among the Contents will be found the following: Introduction—Explanation of Technical Words. Part I. On the First Principles of Mechanics.—Table of the Surfaces of Contacts without Unguents—Tables of the Results of Experiments on Friction, with Unguents, by M. Morin—Table of Diameters of First Movers—Table of Diameters and Circumferences of Circles, Areas, and Side of Equal Squares—Geometrical Definitions of the Circle and its Parts—Centre of Percussion and Oscillation. Hydrostatics: Introduction—On the Upward and Downward Pressure of Water—Specific Gravity—Table of Specific Gravities—Hydrodynamic Power of Water-wheels—On the Action and Reaction of Water, as applied to Water-wheels—On the Construction of the Combination Reaction Water-wheel—Table of Velocities of Water-wheels per minute, with Heads of from four to thirty feet—Table of the Number of Inches of Water Necessary to Drive one Run of Stone for Grist or Saw-mills on Heads of four to thirty feet—Table showing the Required Length of Overshot and Breast-wheels on Heads of ten to thirty feet—Table showing the Velocity of Water. Part II.—Practical Milling and Millwrighting.

PALLETT.—*The Miller's, Millwright's and Engineer's Guide.* By HENRY PALLETT. Illustrated. In one vol. 12mo., $3.

LEFFEL.—*The Construction of Mill-Dams:* Comprising also the building of Race and Reservoir Embankments and Head Gates, the measurement of streams, gauging of water supply, etc. By JAMES LEFFEL & Co. Illustrated by 58 engravings. 1 vol. 8vo., $2.50.

LARDNER.—*The Steam Engine:* For the use of Beginners. By Dr. LARDNER. Illustrated. 12mo, 75 cents.

TEMPLETON.—*The Practical Examinator on Steam and the Steam Engine:* With Instructive References relative thereto, arranged for the use of Engineers, Students, and others. By WM. TEMPLETON, Engineer. 12mo, $1.25.

BOURNE.—*Recent Improvements in the Steam Engine:* In its various applications to Mines, Mills, Steam Navigation, Railways, and Agriculture. Being a supplement to the "Catechism of the Steam Engine." By JOHN BOURNE, C. E. New Edition. With numerous Illnstrations. 16mo. Cloth, $1.50.

BYRNE.—*Handbook for the Artisan, Mechanic and Engineer:* Comprising the Grinding and Sharpening of Cutting Tools, Abrasive Processes, Lapidary Work, Gem and Glass Engraving, Varnishing and Lacquering, Apparatus, Moterials and Processes for Grinding and Polishing, etc. By OLIVER BYRNE. Illustrated by 185 wood engravings. One vol. 8vo., $5.

EDWARDS.—*A Catechism of the Marine Steam Engine,* For the use of Engineers, Firemen and Mechanics. A Practical Work for Practical Men. By EMORY EDWARDS, Mechanical Engineer. Illustrated by 60 engravings, including examples of the most modern Engines. In one volume, 12mo, $2.

WATSON.—*The Modern Practice of American Machinists and Engineers:* Including the Construction, Application and Use of Drills, Lathe Tools, Cutters for Boring Cylinders and Hollow Work Generally, with the most Economical Speed for the same; the Results Verified by Actual Practice at the Lathe, the Vice, and on the Floor, together with Workshop Management, Economy of Manufacture, the Steam Engine, Boilers, Gears, Belting, etc., etc. By EGBERT P. WATSON, late of the "Scientific American." Illustrated by 86 engravings. In one volume, 12mo, $2.50.

LUKIN.—*The Young Mechanic.* Practical carpentry, containing directions for the use of all kinds of tools, and for construction of steam engines and mechanical models, including the art of turning in wood and metal. By JOHN LUKIN, author of "The Lathe and Its Uses," etc. Illustrated. 12mo, $ .75.

LUKIN.—*Amongst Machines:* Embracing descriptions of the various mechanical appliances used in the manufacture of wood, metal, and other substances. 12mo, $1.75.

LUKIN.—*The Boy Engineers:* What They Did, and How They Did It. With 30 plates. 12mo, $1.75.

WILSON.—*A Treatise on Steam Boilers:* Their Strength, Construction and Economical Working. By ROBERT WILSON. Illustrated. 12mo, $2.50.

CONTENTS.—Chapter I. Introductory. II. Strength of Cylinder, Sphere and Flat Surfaces. III. Properties and Character of Boiler Materials. IV. Riveting. V. Welding. VI. Construction of Boilers. VII. Boiler Mountings and Setting. VIII. Incrustation. IX. Wear and Tear. X. Factor of Safety. XI. Testing. XII. Boiler Explosions. XIII. Combustion of Coal. XIV. Smoke Prevention and Firing. XV. Heating Surface. XVI. Boiler Power. XVII. Bursting and Collapsing Pressures of Cylinders.

ROBINSON.—*Explosions of Steam Boilers:* How they are Caused, and How They May be Prevented. By J. R. ROBINSON, Steam Engineer. 12mo, $1.25.

CONTENTS.—Explosions Caused by Low Water, by Over-Pressure, by Defects in Materials, etc.; by Scale or Sediment, by Repulsion of the Water; by Overheating of the water; How Explosions Caused by Low Water, by Over-pressure, by Defective Materials, etc.; by Scale and Sediment, by Repulsion of the Water, by Overheating of the Water, May be Prevented.

NYSTROM.—*A New Treatise on Elements of Mechanics:* Establishing Strict Precision in the Meaning of Dynamical Terms: accompanied with an Appendix on Duodenal Arithmetic and Metrology. By JOHN W. NYSTROM, C. E. Illustrated, 8vo, $4.

MOLESWORTH.—*Pocket-Book of Useful Formulæ and Memoranda for Civil and Mechanical Engineers.* By GUILFORD L. MOLESWORTH, Member of the Institution of Civil Engineers, Chief Resident Engineer of the Ceylon Railway. Second American, from the Tenth London Edition. In one volume, full-bound in pocket-book form, $2.

ROPP'S COMMERCIAL CALCUCATOR: Containing many convenient and valuable Tables, showing the value of Wheat, Corn, Rye, Oats, Barley, Cattle, Hogs, Hay, Coal, Lumber, Merchandise; the simple and compound interest at 6, 7, 8 and 10 per cent.; Measurement of Boards, Scantlings, Timber, Saw Logs. Cisterns, Tanks, Granaries, Corn-Cribs, Wagon-Beds, Time Table, Wages Table, etc., etc., etc.; also entirely New and Practical Method of Rapid Calculation. By CHRISTIAN ROPP, Jr Pocket-book form, cloth, $1.

MCLEAN.—*The Miller's Text-Book.* By JAMES MCLEAN, of Glasgow, Scotland. Price, postpaid, 60 cents.

Any other books, either domestic or foreign, that our readers may desire, we shall be pleased to obtain and furnish to them at the lowest rates, postpaid, to any part of the United States or Canada.

Continental Exhibition of South America.

The Continental Exhibition of South America to commemorate the third centennial of the foundation of the city of Buenos Ayres in the Argentine Republic, will be opened on the 15th of September and closed on the 15th of December, 1880. L. W. Morris. of No. 50 Broadway, New York. has been appointed General Agent for the United States, to receive applications and forward exhibits. The charge to exhibitors consists of the freight, and $4.75 per square yard of space used, and some other contingent charges.

Although the Exhibition chiefly aims at giving to the people of the Argentine Confederation an opportunity to judge of the ingenuity demonstrated by the manufacturers of the United States in their machinery, apparatus, implements and processes (other foreign articles being excluded from the Exhibition proper), it will at the same time offer an occasion to show also what is done by us in our various manufactures, which will be exhibited in a place in the immediate proximity of the Exhibition buildings, and thus a field may be opened for their introduction into the vast territory of the Argentine Republic and its neighboring States, the principal industries of which are sheep-farming, cattle-raising, wheat-growing, milling, tanning, and general agriculture.

The articles to be exhibited are divided into six sections:

Sec. 1.—Natural and agricultural products.
Sec. 2.—Machines, implements and tools.
Sec. 3.—Products of general industry.
Sec. 4,—Fine arts.
Sec. 5.—Public instruction.
Sec. 6.—Animals for breeding purposes.

Prizes, consisting of gold, silver and bronze medals, and honorable mention, will be awarded on the day of closing the Exhibition.

THE "ALTOGETHER--QUITE--TOO--PERFECT" MAN.—Of him Talmage said in his last Sunday's sermon: I hate the perfect men. I never was so badly cheated in my life as I once was by one of your "perfect" men. He had got so far up in morals that he couldn't see the rules of common honesty. These men who go prowling around prayer meetings telling how much like saints they are—look out for them; keep your hands on your pocketbooks. The "higher-life" man of a certain class who goes around with a Bible under his arm and who rushes into the counting-room of a merchant who is adding a column of figures, and exclaims: "How's your soul?" is a nuisance. He makes religion a dose of ipecacuanha. I tell you a roaring, roistering, bouncing sinner isn't so repulsive to me as one of that sort of higher-life men.

CORN COBS FOR FUEL.—Mr. Ira A. Holly, Superintendent of the water works at Burlington, Iowa, reports that for the first 20 days of last December he ran his boilers exclusively upon corn cobs. During that time the engines pumped 5,818,698 gallons of water 246 feet high; 81,466 pounds of corn cobs were used during the time, or 4,073 pounds per 24 hours. The pumps averaged about 290,934 gallons in the same length of time. In a letter from Mr. Holly, in which these particulars are given, he says the duty is about 14,700,000. Now figure that duty at the price we pay for soft Iowa coal. It would take 3½ pounds of cob to do the work of one pound of coal; duty figuring according to price, 55,600,000 pounds of water raised one foot high per hundred pounds of coal." This is a rather remarkable statement.

The following shows the quantities ground by the various Pesth mills in 1878 and 1879—in centner of 123 lb:

	1879.	1878.
Ofen Pesth	712,000	688,390
Concordia	554,000	513,632
Pannonia	511,000	562,081
Walzmuehle	435,000	460,000
Verb Dampfmuehle d Ung etc	414,000	393,000
H. Haggenmacher	401,000	352,709
Victoria	361,069	378,143
Elizabeth	340,000	290,732
Mueller and Baecker	294,192	232,629
Louisen	287,000	276,300
Total	4,309,261	4,147,616

The Old Mill.

Here from the brow of the hill I look,
Through a lattice of bows and leaves,
On the old gray mill with its gambrel roof,
And the moss on its rotting eaves.
I hear the clatter that jars its walls,
And the rushing water's sound,
And I see the black floats rise and fall
As the wheel goes slowly round.

I rode there often when I was young,
With my grist on the horse before,
And talked with Nelly, the miller's girl,
As I waited my turn at the door.
And while she tossed her ringlets brown,
And flirted and chatted so free,
The wheel might stop or the wheel might go,
It was all the same to me.

'Tis twenty years since last I stood
On the spot where I stand to-day,
And Nelly is wed, and the miller is dead,
And the mill and I are gray.
But both, till we fall into ruin and wreck,
To our fortune of toil are bound;
And the man goes and the stream flows,
And the wheel moves slowly round.

—*Thos. Dunn English in Harper's for April.*

NEWS.

EVERYBODY READS THIS.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Pembina is to have a 4-run mill this season.

Kentucky millers complain of considerable damage on account of high water lately.

The Dakota Water Power Co., at Sioux Falls, has increased its capital stock to $500,000.

Much flour is being stored in the Northwest awaiting the opening of lake navigation.

Bruce F. Johnson succeeds the firm of S. S. Kennedy & Co., at Greeley, Colorado. It is said that Mr. Kennedy intends soon to put up a large new mill.

James Thompson's oat-meal mill at Lanesboro, Minn., with a capacity for using 2,000 bushels of oats per day, will be in operation soon.

Kimble & Kitzman are building a 3-run water-power mill at Janet's Ford, Minn. Leffel's wheel is used.

Messrs. R. Aleshire & Co., of Gallipolis, O., are completely remodeling their mill. When completed it will be a first-class new-process 6-run mill driven by steam power.

EXPLOSION.—The boiler in the flax-mill owned by Rosenthal & Co., at Frankfort, Ind., exploded on the morning of March 11th just before the hour for going to work. All the employes in the mill, ten in number, were instantly killed. The ruins at once caught fire and were totally consumed. Loss on building $10,000; no insurance. The mutilated bodies were recovered. The boiler was an old one.

BURNED.—The flour mill of Baker, Johnson & Co., at Shoals, Ind., was burned March 12, together with 4,000 bushels of wheat, 150 barrels of flour, a lot of corn, bran, etc. Loss, $15,000; no insurance.

FATAL ACCIDENT.—Frank Morris got caught in the machinery at the mill in Oconee, Ill., March 1st, and was instantly killed.

W. H. Sullivan, of Whitewater, Wis., the champion horse-shoer of State of Wisconsin, gave us a call during the past month. He claims that horse-shoeing is a science that few shoers really understand.

1,551,789 barrels of flour were made in Minneapolis during the year 1879, of which 442,598 were exported direct to Europe.

Henry & Co.'s 5-run steam power mill, at Huntingdon Co., Pa., has started up. They have also one set of rolls. The capacity of the mill is 200 barrels per 24 hours.

N. Mendenhall has purchased the Hancock Steam Mill, at Hancock, Md., and will entirely remodel them to a new process mill.

ACCIDENT.—The engine in the Bluff flouring mill at Red Wing, Minn., was totally wrecked recently by the breaking of the cylinder head.

BURNED.—March 6th, the grain elevator owned by Munger, Markell & Co., at Duluth, Minn., was burned with contents. The building cost $50,000 in 1872, and was insured for $20,000. It contained about 170,000 bushels of grain, on which there was an insurance of $85,000.

EXPLOSION.—The boiler in the two-story grist mill of Solomon Zeigler, at Brotherton, opposite St. Charles, Mo., on the Mississippi River, exploded with terrific force March 9th, and tore the old mill to atoms. Simon Zeigler, a son of the proprietor, who acted as engineer, was killed outright, and a colored boy named Williams, the fireman, injured so badly that he died an hour after the accident. Cause of the disaster, a lack of water in the boiler.

The Board of Trade, at Fargo, Dakota, earnestly advises farmers to clean their wheat and have it in a perfectly dry condition when they market it. They think that as a rule the farmers thresh their grain too soon after harvest. The past season their has been considerable fault found with dirty and damp grain from portions of Dakota.

Ames, the Northfield, Minn., miller, has just been elected mayor of that lively little city.

The Minnesota Millers are called to meet in council at Minneapolis, April 13th to take steps towards being properly represented at the Cincinnati Exhibition. Minnesota is expected to make a grand show at that Exhibition.

Jay Gould is now investing in town lots at Duluth. Has he been reading J. Proctor Knott's memorable Duluth speech.

John Webster the well known Detroit millwright is said to have nearly recovered from a recent illness.

The StCroix flour mills, at Stillwater, Minn. have been compelled to shut down on account of scarcity of wheat. This is the case with hundreds of mills throughout the West.

The Richwood Mills, at Richwood, Minn., have changed hands. The present proprietors are Brookins, Abbott & Campbells. They will remodel the mill this coming summer from old to new process. The firm is known under the style of the Richwood Mill Co.

The freight rates on flour from Minneapolis have recently been reduced 10 cents per barrel and flour is moving eastward again.

Chicago is to have a glucose manufactory, on a large scale. There's money in it; hence its proposed construction. Papers have been sent to Springfield for the incorporation of the company—capital, $650,000, paid up. On this amount Messrs. Matthieson and Weichers, who are conducting an immense sugar refinery near New York, and are represented here by Henry C. Carver, contributed $350,000. As this is a majority of the capital, the control, it is understood, is to be in the hands of Chicago parties, the principal ones being Mr. Cyrus H. McCormick, who takes about $75,000 worth of stock; Mr. Marshall Field, Mr. L. Z. Leiter, Mr. George M. Pullman and Mr. N. K. Fairbank, who takes the remainder. These names are a guarantee that the works will be built. The manufactory which they propose erecting will, it is understood, have a capacity per day of 50 car loads of corn, or 20,000 bushels. It requires, it is said, about 350 gallons of water to each bushel of corn to extract the starch from it. Here's wherein lie the profits. A bushel of corn, costing about 40 cents, produces thirty pounds of grape sugar, or three gallons of sirup. This sugar, which costs them net two cents per pound, they can sell at from three and one-half to four cents, while the three gallons of sirup can be sold at from 35 to 40 cents a gallon.

The Milwaukee Middlings Millstone Co. have now completed the magnificent new mill which they have been building for Mr. B. Stern in Milwaukee, and it is the finest mill in the Northwest in every respect.

The following is the record of flour manufacture (in barrels) in Indianapolis, Ind.: 1875, 140,000; 1876, 146,522; 1877, 203,583; 1878, 192,000; 1879, 210,822. Indianapolis has 10 grain grinding establishments, including flour mills, hominy mills and a starch factory in which $304,000 is invested, which in the year 1879 used $924,500 worth of raw material and turned out a manufactured product valued at $1,076,800, and employing 73 persons to whom $40,800 was paid for services.

The failure of Mrs. Hibbard & Graff millers of Grand Rapids, Mich. is reported. Liabilities reported very heavy, including $400,000 borrowed money. Speculation in grain options is said to be the main cause of this failure which also includes L. H. Randall president of the Farmer's and Mechanics' Bank, of Grand Rapids, and H. W. Hindsdale a well-known capitalist of the same city. When millers indulge in option trading, because business is dull, they are traading on dangerous ground.

The Milwaukee Middlings Millstone Co. have, during the past month, made heavy shipments to Dakota, California, Colorado and Missouri.

Tower City, Dakota, is to have a flouring mill.

A six run mill is to be built at Dell Rapids, Dakota, this summer.

The Milwaukee Middlings Millstone Co. have just started up Messrs. J. K. Mullens & Co.'s mill at Denver, Colorado, which they have been remodeling, and it has been pronounced the best arranged mill in the State.

Munger & Markell's elevator at Duluth, Minn., is to be rebuilt.

The Eggert grist mill at Peshtigo, Wis., is to be rebuilt this season.

The Knapp, Stout & Co.'s new flouring mill at Rice Lake, Wis., is completed and ready for business.

Col. Marsh, at Valley City, Dakota, is rushing forward the material for his mill and dam at that place.

A steam grist mill is to be built at Herman, Lake county, Dakota, this summer. Hay will be used for fuel.

The steam flouring mill at Clinton, Wis., has been supplied with new and improved machinery, and is doing good work.

Mr. Batzle, of Owatonna, Minn., offers a good mill site free of charge to anyone who will put up a good mill at that place.

The flouring mill of the Eau Claire Lumber Co., at Eau Claire, Wis., after undergoing extensive repairs, is again in operation.

There is a prospect of another grist mill at Clintonville, Wis., this summer, in addition to the one owned by Stack & Metzner.

Mr. Charles Espenchied has taken possession of the Vermillion mills at Hastings, Minn., most of the old employes are retained.

Mr. S. R. Ames has severed his connection with the Ames mill at Northfield, Minn., and gone to Sioux Falls, Dakota, to engage in farming.

The Milwaukee Middlings Millstone Co. has contracted to build a mill at Jamestown, Dakota, for Mr. Anton Klaus.

The Shaber flouring mill at Phalen's Creek, Minn., recently burned, is to be rebuilt, and carpenters are now engaged in constructing the frame.

The Salem, Oregon, flouring mill is the largest mill in that section. It has twelve run of stone and turns out 650 barrels of flour every twenty-four hours.

Louis Weitzell's mill dam at South Elkhorn, Ky., was recently washed out by high water. The loss is about $1,500, and the mill will have to remain idle for some months.

Arrangements are about completed for the erection of a mill on the Sioux river, two miles west of Sioux Falls, Dakota. It will be called the Queen Bee mill of Minnehaha county.

The Springfield Mill Co., Springfield, Dakota, whose mill was burned some months ago, are preparing to rebuild. The building will be of chalk stone, and the company have purchased a portable engine to be used in sawing out blocks.

The Milwaukee Middlings Millstone Co. are overhauling Messrs. Straubel & Ebeling's mill at Green Bay, Wis.

John Dœhler, of Montpelier, Wis., is about to put up a saw and grist mill on his place in Montpelier.

James Shaw, of Millville, Ky., intends to overhaul his mill, changing it to a new process and adding several run of burrs.

In California seasonable rains continue, giving assurance of a fruitful year. Advices from all parts of the State give good promise, notably for cereals, but for fruits as well. The stock of wheat is increasing rapidly.

A new steam rice-pounding mill is to be erected at Savannah, Georgia. Already over 800,000 bushels of rough rice are annually brought to that city to be cleaned, and with increased facilities, it is believed that a large increase will be made in this amount.

A twenty-run new process mill, to be built by a stock company, is in contemplation at Lexington, Ky. This will be the largest mill in Kentucky, and the only one of the kind in Lexington, a place with a population of 20,000 and good railroad connections.

On and after Jan. 1, 1880, the following number of bushels will constitute a car load, in selling and buying on 'Change at Kansas City, Mo.:

Wheat	400 bu.
Corn	425 bu.
Rye	425 bu.

Other grain, 24,000 lbs.

The Milwaukee Middlings Millstone Co. have just taken another large contract in Colorado.

E. Wessel, formerly of Bloomington, Ill., has recently bought the flouring mills at Newport, Mich., and is remodeling it to a new process mill.

It is rumored that one of the oldest mills on the canal in Milwaukee is about to change owners. In fact the inventory has been already taken, and no doubt the sale will soon be completed, when it is probable that considerable improvements in it will be made. We are not at liberty at present to name the mill.

Messrs. Smith Bros., the Milwaukee millwrights, are still engaged on the immense Schlitz's brewery. They are now preparing a set of rolls for crushing malt, to have a capacity of 3,500 bushels of malt per day of 12 hours.

Foreign Items.

The third centenary of the foundation of Buenos Ayres, South America, will be celebrated by a grand international exposition during the present year. Sig. Julio Arditi, of Buenos Ayres, Argentine Republic, is the President of the exhibition.

Forty-four million bushels of wheat were shipped from the port of Odessa, Russia, during 1879, carried by 1,101 vessels.

About 8,500,000 bushels of wheat were ground by ten mills in Pesth, Hungary, during 1879. In 1878 the same mills ground about 8,300,000 bushels.

Quite a cargo of fresh meat, consisting of beef, veal, lamb and mutton was recently imported into England from Australia. The vessel carrying it passed through the Red Sea and Suez Canal, and experienced pretty warm weather. The meat generally was found to be excellent upon its arrival.

An invention has recently been made in North Germany of a material for making millstones and also for forming the surface of wheat scouring machines. G. A. Buchholz is the inventor.

Lange's Mills at Altona, Austria, which were recently burned, are to be rebuilt from plans made by Adolf Fischer. C. E., of Budapest, Hungary.

A SECOND railway tunnel through the Alps—the Mt. St. Gothard—connecting Italy and Switzerland, nine and a quarter miles in length, has been completed. The first tunnel—the Mt. Cenis, connecting Italy and France—was completed in 1871, and is about eight miles in length. The latter cost $15,000,000, and the former $10,000,000.

Trials of Ticket Agents.

Dramatis Personæ—Ticket agent and elderly lady. "What time does the train arrive?"

"Nine-fifty."

"When does it leave?"

"Ten."

"How long does it stop?"

"Ten minutes."

Elderly lady produces watch, got up on clam-shell principle, with States-prison escapement—no go—and looking at the clock, asks:

"Is that the right time?"

"Yes, ma'am."

"Is it railroad time?"

"Yes."

"Are you sure, cause I don't want to get left."

"Yes'm, quite sure."

"Well, it 'pears to me it's five minutes too slow."

"No'm, it's correct; your time is probably fast."

"See here, young jack-snipe, don't give me any of your sass; that watch won't take a back seat for any of your new-fangled jim-cracks."

The agent wilts.

"Now, young feller, what is the fare to St. Paul?"

"Six twenty-five."

"How?"

"Six dollars and twenty-five cents."

"Oh! you folks don't charge nothing now, do you?" For goodness sake, how much do you charge per mile?"

"Four cents."

"How far is it?"

"One hundred and fifty-nine miles."

Agent grabs ticket to St. Paul, stamps it and says:

"Six and a quarter, please."

"What for?"

"For a ticket to St. Paul."

"Who said I was going to St. Paul? I'm sure I didn't. But perhaps you're so smart you know better than I do where I'm going."

Agent is about to say something, when he is cut short by his tormentor, who says:

"Gimme a ticket to Benson, and don't keep me standing here all day."

Well, we expected to see the agent's smiling face wreathed in frowns, but no; with a calmness truly wonderful he puckered up his lips and whistled, "I'm a Little Buttercup."—*Morris Tribune.*

Remarks on Grinding.

BY JAMES M'LEAN, OF GLASGOW, SCOTLAND.

In the British town mill, grinding requires especial care and good judgment. Stone dressing, often the highest paid department, being sleight of hand work compared to the skill and judgment required in a good grinder; carelessness or want of skill is easily checked with the stoneman, it is far otherwise with the grinder; negligence or bad judgment occasionally causing a serious loss, or altering the character of the flour completely, the master too often not having the skill to know what is wrong. There is little divergence in the practice of stone dressing, so that a little experience enables the master to know the good from the bad one. Grinders diverge widely in practice, not only individuals but whole countries, so that sometimes it is better to have a grinder with little experience under able guidance, than trusting wholly to one with a life-long experience.

The principal qualifications in a good grinder is to have the sense of feeling well developed; some individuals are remarkable for the extreme sensitiveness of their feeling, with others it is so dull that they are in perpetual doubt as to whether they are right or wrong, others again have it better in one hand than the other; my own experience showing me this being always in anxious doubt for some years, when young feeling with the right hand as is customary (and grinders well know that whenever they begin to doubt and get anxious they make the sense of feeling still worse), till noticing the left hand had the sense more perfect, I rarely used the right one afterwards. It is well known how cold, dirt, or handling tools such as the pick handle affects the feeling, and they have to exercise it for some time after before they can trust it. Spouts are often badly arranged also for catching the flour. When the arrangement is bad, a piece of zinc can often remedy it a good deal, so as to throw it all into the hand in a gentle stream, aiding the feel greatly, and giving a guess as to the speed.

The general practice in feeling the flour is to let the hand fill more or less, then press down the thumb through it and along the points of the fingers, that is, on the top of the pressed down stuff. Some press down the thumb, shutting the hand at the same time on a full handful. Inexperienced individuals sometimes imagine that rubbing small quantities between the points of the fingers and thumb is always sufficient, but practice teaches otherwise—the sense of feeling of very few being so perfect as to detect the sharpness or size of the particles in very close grinding, unless they are in number sufficient to cause a more or less thickness between the thumb and fingers; pressure seeming to aid the sensation without their contact. Thus, in close grinding, pressing the thumb repeatedly on the descending stuff on the points of the fingers, and then rubbing it along, enables one to feel a sharpness; when, by rubbing unpressed stuff, no sharpness or particles can be detected. With the most of wheats, however, it is safer to feel the particles with a loose, easy feel, on the points of the fingers, judging their size better thereby, and the pressing of the thumb down through a handful giving an idea as to the average sharpness, or if there is any or what amount of felled stuff. This is a term applied in Scotland when it is overcrushed or polished by the rotary motion being destroyed, and expresses the real injury, as it takes some time to recover; the atmosphere restoring its adaptability for fermentation, but it never fully recovers from the effects of the polishing. The experienced grinder readily detects it from its oily smoothness, and if the proportion is too great it begins to lie on the outside of the stone, it being unable to grip a portion of it at all. It thus causes increased pressure, heat and moisture, and spreading over like paste, stops all air motion, and, if not checked, finally lifts the stone and rolls out in steaming worms. Even with a slight pasting over, it is better to lift the stone at once, as it takes a long time of wasteful and injurious grinding to partially recover, and never recovers its full keenness till lifted. In choosing a medium betwixt over-crushing and over-sharpness, conjoined with their effects on the bran, lies the skill of the grinder—some wheats standing a considerable amount of each without injury, while with others no freedom can be used either way.

As mentioned before, proper wheat grinding being the right approximation of the crushing and cutting process applied, I will endeavor to explain the different styles of grinding, and the effects of each.

Wheat for grinding purposes may be divided into four qualities, namely, weak-soft and weak-hard, and strong-soft and strong-hard.

The first, or weak-soft, is easy ground in comparison to the moisture it contains, and can go over a great amount of face without injury to the bran, or over-polishing of the flour, from the light pressure required to disintegrate it, and hence have broad, clean bran, can be free and easily dressed, and is not so apt to be injured as the others.

With the second, or weak-hard, practice differs more widely, and it is more often injured. Grinders may be divided into two main classes. There are those who rule the feed chiefly by heat, and never vary the feed much, being determined, whatever the quality of the wheat, neither to have the stone what they consider too low, nor yet pressed with what they imagine too much feed, so as to avoid, in their opinion, over-heating. These do well enough in country mills, where British wheat is always the ruling quantity in a grist, or town or country mill, where they keep the grist of an average softness; but where hard wheats are put often on by themselves they are total failures. The other class are those who know there is a certain freeness, whether on hard or soft wheats, which seems to suit the baker best; and to get this certain freeness, which experience alone can teach, they vary widely, both with feed and closeness of grinding, and consequently with heat, and nothing is more common than for the latter, if strangers (unless they follow the hobby of the former), to be set down as knowing little about grinding; whereas a little reflection would show that it is a very easy matter to grind on the former principle. The latter attempts the right approximation of cutting and crushing by the only means commonly available at their command, but they sometimes err by having too much heat on a heavy proportion of felled stuff, as a stone can work with a considerable amount of the stuff felled before pasting over, the part that hasn't the rotary motion destroyed, carrying it out along with it; but from its injurious effects, a heavy proportion should always be avoided. Hard-weak wheats, however, if the stone is in good face, are not easy felled in the grinding, it taking a great heat and power to do so, as all millers avoid letting the stones smell or char from friction on each other. Although some scientific men say that this is the cause of the heat, the experienced grinder knows it is nonsense, as with a three-horned rhynd he can run the stones clear, yet cause any amount of heat he wishes by varying the feed. Where there is clear face friction it soon warns him by the nose—such as the eye speed getting under 3 feet per second—losing centrifugal force, when they have to be wider separated. Hard-weak wheats can stand the greatest amount of crushing of all the wheats without injury; but as some bakers treat flour pretty much alike, it is often safest to grind the strong-hard similar. It is the opinion of many that the sharper the flour the better, bnt they often find themselves mistaken. Strong-hard may be ground as sharp as they please if properly pounded and watered by the baker; its strength or elasticity enables it to stretch into fine thin cells. It is different with weak-hard. If ground sharp it is what the bakers call short, it can't take the same amount of water without injury; its want of elasticity won't let the large particles stretch sufficiently to make thin cells, and in this state it makes an inferior, troublesome loaf. It follows, therefore, it requires a heavy crushing power, provided there is not an undue amount of heat. It is the case also, the drier the wheat the less injurious the heat, and the less liability to be felled; splintering taking place till it is reduced to a very small degree, and the heavy feed saves the bran from being cut up badly, as the sharp particles rolling out have a most destructive effect in pulverizing the bran. To so great an extent can subdivision be carried with some hard wheats, that, if the stone has a bad face or the slighest irregular escape, it will issue sharp, though the stone is charred in the attempt to soften it, which is often checked by putting on such a heavy crushing power, or large feed, that part of the flour is felled, which greatly retards its outward progress and hinders the too rapid escape of the sharp particles, the diminished air inlet allowing extra crushing at the rim to equalize them more.

It is a very common opinion also that hard wheats require a large amount of face; but this is most injurious to both flour and bran. The former is acted on similar to the pease meal in the peastone, and issues in a polished state, or over free, or so short that, if weak wheat, the baker has the utmost difficulty in getting it to adhere at all; and though feeling sharp, the grinding is in reality very low, and the bran is subjected to a long destructive pulverization amidst the sharp rolling particles, and perfect separation afterwards is impossible. What is needed for hard wheat is as small and true a face as possible, with not the least escape, however, for irregular grinding; as when free of overcrushed or felled stuff, it rolls rapidly outwards, and irregularities of escape or face tell seriously by unequal grinding from travelling over so little face.

As an instance of extreme heavy pressure grinding, I will mention Californian and Australian practice. In both those countries the majority grind low, and with a heat unknown in most British mills. The Australians have the British stonespeed and furrows, the Californians the American. In the drier parts of Australia, ten bushels an hour is not uncommon; in California, with the greater stonespeed, they are often forced to put through double that. In both, the stones are kept so low that there is often a portion of felled stuff. Then what occasions this low grinding and heavy pressure with the strong Australian wheat? It is to save the bran, and make the flour handier wrought and whiter; as especially clear or flinty wheats are like glass, the more they are ground down the whiter they get. To show that even high ground strong flour is not always the most acceptable to the bakers, some of as disagreeable bread as ever I saw was in a district famous for its fine strong wheat—namely, Adelaide, in South Australia. The only reason I could imagine for it was that it was baked from the cheap course ground products of some of the country mills, with deficient power and coarse clad wire machines, some of them at that time not going over 74 with their finest wire. The flour had any amount of strength, but some of the bakers, apparently had not the judgment or industry to take full advantage of it by giving it sufficient time and water; and in thirty hours after it got almost like a biscuit, so that the low-ground, heavily-pressed stuff, with its attendant heat and better flour produce, obtained a superior price; on the whole, not that I approve of heat or violent pressure if it can be avoided, but with large stones and high speed to save the bran and obtain handy wrought flour, the miller can't do otherwise. Without doubt, the great heat has often a deleterious effect; as while in Australia, and as at that time it sometimes could not supply itself, they occasionally got California wheat and flour to make up the deficiency—noticing they could often make a superior article out of the wheat to the flour imported, and landing on the Californian coast afterwards.

Well do I remember the first mill in San Francisco I went into, the stones appeared to be four feet, flying about 200 revolutions; putting my hand into the decending stream from one of them the heat was so intense that the thought occurred to me at the time, this explains the often inferior flour, but the miller could not do otherwise; the stone size and speed were there, and he must do the best possible; they were furrowed in the usual American system, which, though forcing the stones to do their utmost, is still the best for heavy pressure grinding (if the friction rate is low enough), giving the bran less face to travel over, and equalizing the pressure over the whole of the stone. Though the ripe wheat in the interior of those countries is exposed to the sun's rays, occasionally going over 140 degrees without injury, it is quite different to the heat produced by violent crushing, which raises it to a high heat in a moment. And though dry wheat can stand a much higher heat than soft wheat, still all experience goes to show the milder the crushing is applied, the better the flour, if other circumstances, such as bran cutting and sharpness, do not counterbalance the advantage; and I have invariably found when the stone speed could be reduced to eighty or ninety revolutions on hard wheats the baker was much better pleased with the flour. Heavy pressure grinding with hard wheats has another advantage besides saving the bran—that is the large yield of fine flour without regrinding the sharps. I have known them with a moderate stone speed to go over forty-seven pounds fine flour per bushel, with the silks highest number at 150, without returning any sharps to help the dressing at all. To obtain then for hard wheats a mild crushing pressure, the only alternatives are the Hungarian method of regrinding, and separation to save the bran; or a slow stone speed, and small amount of traveling surface to preserve it. The rule is with wheat as with all other substances; the harder and less tough it is, the more it is adapted for disintegration by crushing, and requires the more slow and less violent friction surface to avoid heat; likewise as little traveling surface as possible, to save the bran, rechipping being less required as the hardness increases.

Strong-soft is a most difficult wheat to deal with, and is the most apt to be injured for fermenting purposes; and as the nearer the flour and bran approach each other in toughness, the more difficult will be their separation; the liability to compression, which tells so seriously on fermentation, increasing the toughness, the cutting principle has ts be brought more into play to get clean bran and free flour, and it should be totally free of felled stuff if possible. Many British millers err greatly in trying to get broad bran with this wheat: far better have it cut up for the purpose of obtaining free flour. With stones running under 120 revolutions, and much of the grinding done near the eye, some tough foreign wheats defy them altogether to make a good job of them, even with as low a feed as three bushels an hour—the distance between the stones has to be so great—to avoid felling, or destroying the rotary motion of the flour, that the bran in spite of its long passage issues badly cleaned. The slow stone speed is not able to chip the tough fibrous particles enough, and the dress is slow and difficult, and all this though it was ground almost without appreciable heat. The means at the miller's disposal for increasing the cutting power, is by increasing the heart, fresh cracking or increased stone speed. The latter, though it would be the most convenient, is very rarely available. On some of those wheats, so easy is the pressure required that the stones can make over 200 revolutions a minute without an injurious heat or much dust. The increased speed gives greater cutting power, the tough particles are rapidly chipped into shape, keeping up the rotary motion with the stones closer, thus cleaning the bran better, and though it is much cut up in appearance, there is little of that destructive minute pulverization to which the bran of hard wheats is subjected to amidst the hard rolling particles of flour between close friction surfaces. With the soft wheats the pressure has to be light, with a considerable distance between the surfaces, to keep up the rotary motion, and the soft flour particles enable the bran to travel over a great extent of surface without affecting easy separation afterwards; when ground free with little pressure it is the bulkiest of all flours, and can be used immediately, requiring delay in using according to the extent of the crushing.

Strong hard wheat requires often almost similar treatment to the weak hard, the cutting power, of course, needing to be brought more into play with equal moisture, although there is the important difference that it can be ground as sharp as wished, if properly treated by the baker afterwards. For special purposes, such as pastry bakers often require it for, light pressure grinding, which, to save the bran can only be done by the Hungarian method, or the slowest stone speed possible tell greatly in its favor. The particles are then free of dust (or very small particles which abound in proportion to the violence of the shivering) in which state, with the superior time and labor bestowed upon by the baker it seems to attain the greatest amount of strength, but the miller, at the same time, is put to more expense from the regrindings required, or the greater amount of sharps resulting from the slow stone speed.

A MILLING firm in Germany adverties for a manager for their mill, offering the munificent salary of four hundred marks ($100) and board and lodging; another milling firm offers about $325 per year to a head miller, and yet every number of the German milling journals contains dozens of advertisements from parties anxious to secure positions of this kind.—*Milling World.*

VENTILATING BEDROOMS.—A simple device for ventilating bedrooms is within the reach of every one having an ordinary window in his room, by which fresh outer air can be admitted in small quantity with such an upward current as will prevent its being felt as an injurious draft by the inmates. It is particularly adapted to sleeping rooms when the weather is too cold to admit of an open window. Thus, start both top and bottom sashes of the window half an inch, which is not quite enough to clear the rebate or stop-beads at top and bottom, but which leaves an opening of an inch between the meeting rails, through which a current enters, but diverted upward by the glass as it should be, so as not to fall directly to the floor, as its coolness might otherwise induce it to do. It thus becomes well mixed with the air of the room without being felt as a draft.

Mill Stones and Bolting Cloths.

The stones most used in mills for grinding grain are the French, although in some flouring mills steel-faced stones are used, but they only succeed in making a flour vastly inferior to that produced by the French burr. From the receptacle in which the flour falls it is carried at once to the bolt This is a large cylinder covered with bolting cloth, and made to revolve, sifting out only the finest flour. It is of the utmost importance to the miller who is desirous of turning out flour of a good grade, that both the millstones and bolting cloths he uses should be of the best quality. This being the case, he naturally, when in need of such articles, wishes to know where he can obtain them, and from the most reliable source. Such a house can be found in that of Mr. Samuel Carey, of this city.

The mill stones supplied by Mr. Carey are imported from France, and from his own shop in that country, where he employes a resident foreman to select from the quarries the stone best suited to this market. The result of this extreme care has been that after many years' active dealing in such goods, Mr. Carey can refer to a long list of his old customers who still continue to prefer his mill stones to any other, having, as all must do who try them, found them excellent and coming fully up to the standard of merit, which he unhesitatingly claims for them. He is also sole agent in the United States and Canada for the celebrated "Anker" brand bolting cloths. This cloth was first made at Amsterdam, Holland, was branded with an anchor, and being of great superiority for bolting flour, soon obtained a wide-spread reputation. The Swiss subsequently copied it, branded their goods with an anchor, and called it Dutch. *Now* all the best bolting cloth, it is said, is made near Zurich, Switzerland. A French cloth is sold here also as "Dutch Anchor," and to distinguish that for which he is agent from it, Mr. Carey brands his with a *double* anchor. The best silk and most skillful workmen only are used in making his cloth. Mr. Carey has been engaged in the mill-supply business for many years, his office is at No. 17 Broadway, and stone-yards at Nos. 12 to 20 Pearl street. He claims to have the best facilities for furnishing these supplies of all kinds, and at the lowest rates for which goods of the best class can be put upon the market. Among the goods he handles are smut machines, purifiers, portable mills, spindles, etc., also oak-tanned leather belting, rubber and canvas beltings. He is, in addition, the only agent for the Susquehanna grindstone, one of the best in the world for hulling all kinds of grain (these can be quarried of any size). As a merchant, Mr. Carey's reputation stands second to none in the trade.—*N. Y. Produce Ex. Bulletin.*

For Sale or Exchange.

Advertisements under this head $2 *per insertion, cash with order.*

FOR SALE—A four run New Process Grist Mill, located in a county seat in Nebraska, and in the heart of a very fine wheat country. New and first-class machinery and building. For particulars apply to
martf B. P. PERRY, Richmond, Ind.

FOR SALE—A Two-run Water Mill, new process machinery, etc., all complete for Custom Mill or Merchant Mill. Plenty of water the year round to run night and day. House, stables, etc. Will be sold cheap on easy time. Address E. W. THOMAS,
apr2t Lyons, Iowa.

FOR SALE OR EXCHANGE—A 2-run steam Grist and Circular Saw-Mill. Mill is 2½ stories high, 20x72 feet on ground; wood. One acre of ground with mill. Will exchange one-half for good timber land in Missouri, Wisconsin or Illinois, $500 cash and balance on 2 years time. Address, THEO. E. ROWE,
feb-2t Lexington, Ill.

FOR SALE—A 3-run Steam Flouring Mill with good run of custom. Situated on a railroad. Flour has a good reputation. It is in one of the finest wheat counties in the State. Good town and good society. Satisfactory reasons for selling. Will take part trade. Price, $2,800; $1,200 cash, balance on good time. For particulars address G. M. W., Box 172, Waveland, Montgomery Co., Indiana. mar

WATER MILL FOR SALE—A merchant mill, situated in Clermont, Iowa, with six run of French burrs and the best machinery throughout. Driven by the best water power in the State. Always plenty of water, with 12 feet fall on solid rock. Located in the best wheat-growing country. Mill building 40x80 feet, five-story brick, near railroad depot. Mill doing a fine business. Mill doing a fine business. Town 1,000 inhabitants, with good schools and churches and good society. Will sell whole on reasonable terms. Reasons for selling, poor health. Address
d3t S. M. LEACH, Clermont, Fayette Co., Iowa.

Situations Wanted, etc.

Millers, Engineers, Mechanics, etc., wanting situations, or mill-owners and manufacturers wanting employes, can have their cards inserted under this head for 50 cents per insertion, cash with order

SITUATION WANTED—In either merchant or custom mill. I thoroughly understand milling in all branches of the business, and will guarantee satisfaction both in yield and quality when parties adopt my system of bolting. From 43 to 46 pounds of No. 1 flour can be made from 60 pounds of clean wheat. First-class references given. Am not particular as to time needed. Can come at any time. Correspondence solicited. Parties answering please give description of mill, state terms, etc. Address MILLER,
apr Rauch's Gap, Clinton Co., Pa.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind.